This Issue Exceeds 86,200 Copies

THE JOURNAL

OF THE

American Medical Association

Subscription, $7.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 104, No. 15 | 535 North Dearborn Street, CHICAGO, ILL. | APRIL 13, 1935

CONTENTS AND SUBJECT INDEX

Bilateral Urinary Calculi, with Special Reference to Therapeutic Problems. Alexander R. Stevens, M.D., New York.....1289
Discussed by Drs. Lewis and Swick.

Production and Solution of Urinary Calculi: Experimental and Clinical Studies. Charles C. Higgins, M.D., Cleveland 1296
Discussed by Dr. O'Conor.

Recurrent Urolithiasis: Etiologic Factors and Clinical Management. Linwood D. Keyser, M.D., Roanoke, Va.....1299
Discussed by Drs. Ewell, Twinem and Keyser.

The Medical and Surgical Treatment of Calculous Anuria. George F. Cahill, M.D., New York.....1306
Discussed by Drs. Trattner, Watson and Cahill.

The Present Conception of Renal Lithiasis. Virgil S. Counseller, M.D., and James T. Priestley, M.D., Rochester, Minn.....1309
Discussed by Drs. Lynch, Chute and Counseller.

Management of Ureteral Stone: Operation Versus Expectancy and Manipulation. Frederic E. B. Foley, M.D., St. Paul.....1314
Discussed by Drs. Engel, Herrick and Foley.

An Investigation of the New Biologic Test for Hormones in Pregnancy Urine: Preliminary Report. Israel S. Kleiner, Ph.D.; Abner I. Weisman, M.D., and Harry Barowsky, M.D., New York.....1318

Poisoning Due to Thallium Sulphate. E. P. Jordan, M.D., Chicago..1319

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Emeraude Perfume Dermatitis. Norman Tobias, M.D., St. Louis..1322

Death Following Coagulation of the Cervix. Robert I. Hiller, M.D., Milwaukee 1323

GLANDULAR PHYSIOLOGY AND THERAPY

Pregnancy Tests. Selmar Aschheim, M.D., Berlin.....1324

SPECIAL ARTICLE

League of Nations Investigation and Report on Treatment of Early Syphilis. By the Committee of Experts on Syphilis and Cognate Subjects, Zurich, Nov. 21-23, 1934 1329

COMMITTEE ON FOODS 1331

EDITORIALS

Food Poisoning.....1332

Transmission of Amebiasis.....1333

Oakland County, Mich., Medical Emergency Relief.....1333

CURRENT COMMENT

Yellow Fever.....1334

Inheritance of Pigmentation....1334

MEDICAL ECONOMICS

The Influence of Sickness Insurance on Diphtheria Morbidity and Mortality 1335

(Subject Index on next page)

ASSOCIATION NEWS 1336

A. M. A. CONVENTION, ATLANTIC CITY, N. J., JUNE 10-14, 1935

CURTIS' "Textbook" of GYNECOLOGY

FOR the second edition of his one-volume "Textbook" of Gynecology, Dr. Curtis subjected the text to a very severe revision. He brought it completely in step with today's requirements. Every page shows evidence of this. Over 100 pages of new material and 129 new illustrations were added. The section on Tumors was radically changed. The sections on Endocrine Disturbances and Endocrine Therapy were extensively revised.

This book is the outgrowth of long teaching experience in presenting the clinical facts found during a large gynecologic practice. The book opens with a chapter on "The Gynecologic Patient Presents Herself" in which you are told how to take the history, how to examine, how to determine those things which will aid in the differential diagnosis.

Under Treatment the worthwhile therapeutic methods are given, with the indications for each treatment. Both medical and surgical measures are detailed explicitly and surgical technic is elaborately illustrated. In fact, this text contains 351 illustrations, chiefly the work of Tom Jones.

Octavo of 493 pages, with 351 illustrations on 300 figures. By ARTHUR HALE CURTIS, M.D., Professor and Head of the Department of Obstetrics and Gynecology, Northwestern University Medical School. Cloth, $6.00 net.

Other important SAUNDERS BOOKS on Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics.

A. M. A. Annual Congress on Medical Education 1336
Abortion, septic, fatal coagulation of cervix.*1323
Acrodermatitis chronica atrophicans....ab-1366
Adrenals, rôle in water exchange.....ab-1373
Aging of English population.....1349
Alcoholism, chronic, renal disorder in...ab-1376
Amebiasis, water transmission.....E-1333
American Association of Anatomists.....1347
College of Physicians 1347
Amylosis and auric nephritis.....1350
Anemia, pernicious, treatment with congo red ab-1374
Appendectomy, Douglas pouch abscess after ab-1376
Appendicitis and puerperal sepsis.....1359
Arachnitis, cystic spinal, causing medullo-radicular compression.....ab-1372
Association News.....1336
Bacteria, coli-aerogenes group, presumptive test mediums for.....ab-1367
Blood, calcium, vs. serum ultrafiltrate..ab-1366
protein a specific organ?.....ab-1374
transfusion in various conditions.....ab-1376
Board Examinations.....1360
Book Notices.....1361
Books Received.....Adv. page 42
Brain, cortical autonomic epilepsy.....ab-1368
tissue, slough, in head injuries.....1359
tumors, pleocytosis in spinal fluid....ab-1373
water content effect on thujone convulsions ab-1366
Bronchiectasis, atelectatic, x-ray study of lung fields ab-1365
Bulla, giant saccular, of lung.....ab-1365
Burns, tannic acid silver nitrate for....ab-1369
Cancer, research fellowships.....1347
survey, Michigan 1344
Capps Prize awarded to Dr. Gulbrandsen..1343
Carbon Disulphide, poisoning.....1362
Cataract, diabetic, and insulin therapy..ab-1373
Cerebrospinal Fluid, calcium in, vs. that in serum ultrafiltrate ab-1366
Chadwick Medal awarded.....1348
Cheese mites infect bowel.....1358
Child health conference, Maryland.....1344
Chorea syndrome sign of cerebral syphilis ab-1375
Chorionepithelioma, Aschheim-Zondek test *1328
Cod Liver Oil C-1356
Committee on Foods.....1331
Communicable Disease decline, Massachusetts 1344
Congress, U. S., medical bills in.....1347
Constipation, olive oil for.....1359
Convulsions, thujone ab-1366
Correspondence 1356
Cowpox infection in milkers.....ab-1376
Deaths 1354
Dementia Praecox, blood-cerebrospinal fluid barrier ab-1370
Dermatitis, Emeraude perfume.....*1322
Dextrose solution intravenously, why does it not sclerose and close the vein.....1359
Diabetes Mellitus, surgical intervention ab-1376
cataract and insulin therapy.....ab-1373
Diathermy, death after coagulation of cervix *1323
Diet, acid ash, and urolithiasis...*1296; *1299
feeding experiments in high school with rats 1357
in esophageal stenosis.....1357
Diphtheria, immunity and the saliva.....1351
morbidity and mortality, influence of sickness insurance.....ME-1335
Doisy, E. A., awarded medal.....1345
Douglas Pouch, abscess after appendectomy ab-1376
Ear, maldevelopment 1358
Eczema, maize oil for.....ab-1366
Emeraude perfume dermatitis.....*1322
Emergency relief, Oakland County, Mich.E-1333
Endocrinology, graduate course in.....1345
Epilepsy, cortical autonomic.....ab-1368
Esophagus stenosis, diet in.....1357
Eye, industrial strain.....1352
Feces, concretions simulate ovary tumors ab-1376
Firemen, amebiasis in.....E-1333
Food poisoning E-1332
Foreign Letters 1349
Gallbladder calculi, operation for.....1353
inflammation, experimental..(correction) 1376
Geiger, Jacob, medical library.....1344
Goiter, radioactivity relation to.....ab-1375
Gold, toxicity 1349; 1350
Gonorrhea, treatment, living vaccines...ab-1375
Government Services 1348
Granuloma, coccidioidal.....1358
Hay Fever, pollens in Michigan.....1359
Head injuries with slough of brain tissue..1359
riding head forward on trains.....1359
Health record book.....1351
Hernia, diaphragmatic ab-1369
Histamine injections in urticaria.....1359
Hospital, general, function in treating tuberculosis ab-1340
group hospitalization plan, New York...1345
veterans, increase of 6,264.....1348
Impostor, another 1347
Industrial Medicine, Congress of, Turin...1352
Internal Congress on Industrial Accidents and Diseases.....1348
Infants, film to instruct mothers.....1347
sound motion pictures.....1343
Insulin, effect on thujone convulsions..ab-1366
Insurance, health, in 1933, Germany.....1350
health, effect on diphtheria morbidity.ME-1335
Intestines, cheese mites infect.....1358
Jackson, Jabez N., memorial to.....1344
Jaw, malignant disease in upper.....ab-1371
Kidneys, calculi *1289
calculi, present conception.....*1309
calculi, production and solution.....*1296
complications during gold treatment.....1349
cortical extracts, effect on urea retention ab-1372
disorder in chronic alcoholism.....ab-1376
function, new combined dye test.....ab-1372
pain referred to area of.....1357
League of Nations report on treatment of early syphilis *1329
Legs, chronic trophedema.....ab-1373
Leukemia, traumatic, and priapism....ab-1374
Leukocytes in dental pus.....1358
Licensure, annual registration due May 1, Nevada 1345
Liver diseases, blood ammonia after glycine tolerance test ab-1373
primary perithelioma ab-1372
Lung, giant saccular bulla.....ab-1365
roentgen study in atelectatic bronchiectasis ab-1365
Lymphogranuloma inguinale, new reaction (Reiss) ab-1366
Maimonides, anniversary.....1346
Malaria and mosquito eradication, Florida.1343
Marriages 1354
Mayonnaise recipe with liquid petrolatum.1359
Medical Economics.....1335
Medical Education, graduate courses, Michigan 1344
undergraduate teaching of tuberculosis.ab-1337
Medical Examinations and Licensure.....1360
Medicolegal 1364
Meetings, Coming Meetings.....1364
Meninges permeability ab-1370
Meningitis, serous, in epidemic parotitis.ab-1376
Menstruation, skin sensitivity during...ab-1375
Mercury, intoxication states due to.....1353
Milk, yeast vs. irradiated, in rickets...ab-1369
Motion Pictures, sound, of infant.....1343
film to instruct mothers.....1347
Nails, congenital pachyonychia (type Riehl) ab-1375
Negro child, possible from white parents E-1334; 1359
Nephritis, auric, and amylosis.....1350
fatal, after gold salt injection.....1350
Nervous System diseases, specificity of streptococci isolated ab-1368
Neurology, merger of German societies...1352
Neurosyphilis, choreic syndrome sign of.ab-1375
News 1342
Nutrition, back-to-nature 1351
Oakland County, Mich., medical emergency relief E-1333
Olive Oil and elimination.....1359
Ovary tumors, fecal concretions simulate.ab-1376
Pain referred to renal area.....1357
Paralysis, General, blood-cerebrospinal fluid barrier ab-1370
of insane, superdiathermy for.....ab-1368
Parathyroids, hyperparathyroidism and renal lithiasis *1311
Parotitis, epidemic, serous meningitis in-ab-1376
Perfume, Emeraude dermatitis.....*1322
Pericarditis, terminating in septicemia..ab-1370
Petrolatum, liquid, mayonnaise recipe with.1359
Pharmacy act, Oregon.....1346
Phlebitis, tuberculous 1357
Physicians, immigrant, in 1934, U. S.....1347
Pollens in Michigan.....1359
Polycythemia vera and nervous manifestations ab-1367
Pregnancy, diagnosis, bitterling test.....*1318
diagnosis, Aschheim-Zondek test.....*1324
Priapism and traumatic leukemia.....ab-1374
Progestin, clinical use.....ab-1371
Protein metabolism 1351
Psoriasis, cancer of skin.....ab-1370
Puerperal Infection and appendicitis.....1359
Queries and Minor Notes.....1356
Rabies, eradication, Great Britain.....1349
Radio Program.....1342
Radioactivity, relation to goiter.....ab-1375
Rats, feeding experiments with, in high school 1357
Rheumatic Fever, recurrent, with pericarditis terminating in septicemia.....ab-1370
Rickets, beryllium, viosterol in.....ab-1368
infantile, yeast vs. irradiated milk....ab-1369
Saliva and immunity to diphtheria.....1351
Sea, work on the sea.....1352
Skin cancer, psoriasiform.....ab-1370
cancer, rare forms.....ab-1374
sensitivity during menstruation.....ab-1375
Sleep, riding head forward on trains.....1359
Society Proceedings.....1364
South Carolina Medical Association.....1346
Southern California Medical Association...1342
Spinal Cord compression from cystic spinal arachnitis ab-1372
Staphylococcus in food poisoning.....E-1332
State Board Examinations.....1360
Stomach secretion, studies in..(correction) 1376
Streptococcus in food poisoning.....E-1332
Students, sentenced for defrauding.....1345
Submarines, wrecked, use of Davis escape apparatus 1349
Suicide statistics for 1934, Vienna.....1354
Swindler dislocates vertebra.....1346
Syphilis, treatment of early, League of Nations report *1329
Teeth pus, constituents.....1358
Tetanus antitoxin, use 1356
toxoid, administration ab-1367
Thallium sulphate, poisoning.....*1319
Thrombosis, coronary, transitory reduplication of second tricuspid sound.....ab-1371
Tonics and Sedatives.....Adv. page 36
Trachoma, mercuric cyanide injected intracorneally in ab-1370
Trophedema, chronic ab-1373
Tuberculosis, occupational, exogenic superinfection 1352
British Journal of Tuberculosis.....1348
campaign, objectives ab-1336
clinic on wheels, Puerto Rico.....1347
historical aspects ab-1339
treatment, function of general hospital in ab-1340
undergraduate teaching ab-1337
Tuberculosis, Pulmonary, artificial pneumothorax, when to discontinue.....ab-1365
endogenic reinfection ab-1372
treatment, auric nephritis and amylosis..1350
treatment, gold, death after.....1350
treatment, gold, fatal nephritis after....1350
treatment, gold, kidney complications....1349
Tumors, symposium on malignancy, Minneapolis 1344
Tuna liver oil, bluefin, vs. cod liver oil..C-1356
University of Buffalo alumni meeting.....1345
Urea retention, action of renal cortical extracts on ab-1372
Ureterotomy, lumbar, technic.....*1314
Ureters calculi, management.....*1314
Urinary Tract calculi, bilateral, therapeutic problems *1289
calculi, production; solution.....*1296
calculi, recurrent *1299
calculous anuria *1306
Urticaria, histamine injections in.....1359
Uterus cervix, coagulation, death after...*1323
hydatid mole, Aschheim-Zondek test in..*1328
Vein, anterior tibial, tuberculosis.....1357
Vital Statistics, births and deaths in 1934, Md. 1344
death rates, trend, Miss.....1344
Vitamin A, rôle in producing urinary calculi *1296; *1299
D, cod liver oil.....C-1356
Water exchange, rôle of adrenals.....ab-1373
transmission of amebiasis.....E-1333
Workmen's Compensation Acts: asbestosis, pulmonary; an "injury by accident".Ml-1364
Xerophthalmia, treatment ab-1371
Yellow Fever E-1334

THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $7.00 a year. 25c a copy. Canadian $8.50. Foreign $11.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

Volume 104. No. 15. *Copyright 1935 by the American Medical Association.*

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 104, NO. 15 CHICAGO, ILLINOIS APRIL 13, 1935

BILATERAL URINARY CALCULI

WITH SPECIAL REFERENCE TO THERAPEUTIC PROBLEMS

ALEXANDER R. STEVENS, M.D.
NEW YORK

The therapeutic problems peculiar to bilateral urinary calculi are not solved by the application of stated formulas. A few of these, such as operate first (*a*) on the side of the better kidney, or indeed (*b*) in certain groups of cases on the worse side, or (*c*) on the side of recent pain, have become popular and are frequently repeated. My feeling is that these so-called rules do not deal with primary factors but are expressions of frequent secondary effects of these factors and at times may be quite misleading. My purpose in this paper is to point out what I believe to be the more fundamental principles involved, a study of which in a given case should govern therapeutic decisions.

The presence of calculi simultaneously in the two upper urinary tracts is not uncommon. In published series of cases of urinary lithiasis, the percentage of bilateral calculi diagnosed clinically has varied between 8 and 20. Joly [1] recently stated that autopsy records show nearly 50 per cent. Hence this subject is one demanding frequent discussion.

In clinical work one must secure data as complete as possible concerning the patient in general and his urinary tract in particular. The symptoms are sometimes valuable but are not infallible guides in therapy. The size and location of all calculi should be known, whether or not they obstruct, as well as the total renal function, the relative function of the two kidneys, and the presence or absence and degree of infection of both kidneys. Knowledge of all these factors is most important before judgment is rendered of whether to take any action and what.

There is no dependable method of dissolving calculi, but stones may pass spontaneously through the urinary channels or be removed by operation. If the latter procedure is contemplated, one must be sure that the probable benefit justifies the risk. Accordingly there is general agreement that operation is not advisable on calculi in some locations and under certain conditions. Moreover, one must be clear in one's mind on this subject, remembering that considerations applicable to unilateral cases will usually apply equally well to each side in bilateral ones, although the latter may need closer observation.

Large, noninfected, nonobstructing, symptomless stag-horn calculi are usually left alone. Also, there is questionable advantage in trying to remove a large mass of nonobstructing, symptomless small stones occupying an entire kidney; it is nearly impossible to find them all, even with roentgen control at the operation table, and the kidney is badly mutilated in the attempt. There is no hurry in operating for small, symptomless stones in a kidney even in the presence of a low grade infection (they are located with difficulty at operation, and, moreover, there is strong probability of spontaneous passage), whereas one does not dare wait long for the spontaneous passage of ureteral calculi associated with urinary infection. Stones of moderate size that are trapped in a calix need not be disturbed unless there is also persistent infection or symptoms.

In such cases therapy may include little more than occasional observation, including roentgen examination, during a period of patient waiting. I seek to avoid infection in noninfected cases by general care, by avoidance of constipation and by the clearance of any foci of infection found in the body. When inflammation is present one should, in addition to the foregoing, try to improve the infection by cystoscopic methods and the use of antiseptics by mouth, although entire relief is not often obtained without the removal of associated calculi.

What are the reasons for operating in urinary lithiasis? Objectively, (*a*) calculi of the upper urinary tract are a most serious menace when they obstruct the urinary flow; (*b*) they are potent in prolonging infection, and (*c*) they may cause pressure atrophy of the parenchyma by growth of the stone. The first two factors are the important ones and the ones that most frequently demand intervention. Obstruction, particularly when complete, causes dilatation above with gradual destruction of kidney substance, encourages the advent or rapid spreading of infection, and may urgently demand relief; nonobstructing stones, even when associated with chronic infection, permit more procrastination, while the fear of renal atrophy by growth of calculi, in the absence of infection, rarely calls for operation. One or more of these factors are usually noted when symptoms are present, yet cases do occur in which pain or hemorrhage alone is the chief indication for treatment.

On the other hand, the risks of the proposed therapy must be considered fairly. Relief of obstruction by a ureteral catheter, if possible, is usually a relatively harmless procedure; it may give temporary relief from symptoms and danger, may be followed by spontaneous passage of a calculus, and will at least improve the patient's condition for subsequent operation, should that be needed. Ureterotomy is one of the least danger-

From the Urological Department of Bellevue Hospital.
Read before the Section on Urology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.
1. Joly, J. S.: Bilateral Urinary Calculi, Proc. Roy. Soc. Med. **26**: 923-936 (May) 1933.

ous major operations. Pyelotomy entails an added risk, and nephrotomy, particularly if extensive, is decidedly more dangerous. Sometimes, to reduce the danger, drainage alone with perhaps removal of the most obstructing stone, if easily obtained, is all that is advisable. I am convinced from a study of postoperative figures for nonprotein nitrogen that as a rule ureterotomy and pyelotomy cause no immediate or remote decline of renal function, whereas in some cases nephrotomy has been followed by a decided, though perhaps transient, retention of nonprotein nitrogen in the blood (once to 100 mg.) within a week or ten days. Large and multiple incisions in the kidney cortex requiring deep sutures will also probably destroy permanently a part of the cortex. Moreover, secondary hemorrhages and acute kidney infections, when they do occur after operation, are usually encountered after nephrotomy incisions and not after pyelotomy. I feel that fewer untoward results will follow multiple small nephrotomy incisions than one large one and that better results are obtained if no suture of these small wounds is made except to control hemorrhage. Moreover, sutures should preferably be confined to the kidney capsule, should be underpinned with fat or muscle,[2] and as few deep ones should be used as possible.

With these pros and cons in mind, each case of bilateral calculi is reviewed as an individual problem. How can the maximum benefit be offered to the patient with the minimum risk? The answer to this question determines the type of therapy, whether operation (if needed) is done primarily on both sides or only on one; if the latter, which side should be attacked first. The side to be operated on first may or may not be the one giving better renal function tests at the moment. Even if one could determine which kidney has the greater potential function (which cannot be done), that would not always be the side to be operated on first. As stated before, in occasional instances one will not offer initial relief to the side with recent pain, contrary to oft expressed advice. I do not decry the helpful value of symptoms and of the determined relative kidney functions when wisely interpreted but urge particularly that one seek more fundamental reasons for one's decisions rather than follow the time honored formulas.

The knowledge possessed of the probable improvement of renal function or infection as a sequel of operation will also influence the urologist. The more nearly complete urinary obstruction is, the more rapidly will kidney injury occur. The greater this injury, the less the return of function to be anticipated following operation. Unfortunately, one's ability to judge of a kidney's potential possibilities is far from perfect, and I was sorely disappointed in one case because no augmented function could be demonstrated after ureterotomy with removal of a stone, although the primary purpose was a gain of renal function. In instances of bilateral obstructing calculi, in which bilateral operation seems inadvisable, one may theoretically argue in favor of operating first on the side with symptoms of longer duration and usually temporarily lower function, to allow the corresponding kidney a better chance to approach normal, realizing that primary relief of the other side will make that side assume even more of the function of its mate and retain it permanently. (This principle has been repeatedly demonstrated experimentally by Hinman and has been referred to in many papers.) But in such cases one is often dealing with a sick patient and must relieve first the side more recently obstructed, thereby risking a partial functional loss of the other side, as a live patient is preferable to a theoretically well conceived plan of operation.

If nephrectomy will obviously be required on one side, this may well be the primary operation in a septic patient; but usually it is wiser to relieve the other kidney of calculi first and permit its full restoration before doing the nephrectomy.

And so one might run on with special problems requiring individual judgment. Thus it is that in the literature numerous groupings of various combinations, according to the ideas of the author, are offered with the appropriate management. The advice offered is usually sound but the multiplicity of possible combinations is confusing. Hence I urge that less attention be paid to groupings and to rules and formulas, but that treatment be based on a knowledge (*a*) of the principles involved, (*b*) of facts determined by history and examination with more emphasis laid on the location and size of calculi, the total renal function and the presence of infection than on tests of relative renal function, (*c*) of the immediate and remote needs of the patient and (*d*) of the probable risks of various lines of treatment. The immediate needs may overshadow the ultimate good, but always the general aim should be to render the greatest service with the least risk.

This communication is offered after a study of the literature[3] and a careful review and tabulation of thirty-five cases (all but three of which are from the urologic service of Bellevue Hospital) of simultaneous bilateral calculi of the upper urinary tract, which came to operation at my hands. Excepting two earlier records, all cases were seen between 1921 and 1934. I do not include those patients who did not receive surgical treatment: some refused treatment or even examination; treatment was not advised in others because of a concurrent serious medical ailment. One man, deemed beyond surgical aid, was uremic, with very high nonprotein constituents of the blood, ribbons of pus oozing from both ureteral orifices, and a staghorn calculus on one side and recurrent multiple stones

2. Beer, Edwin: Use of Fat to Prevent Sutures Cutting into Parenchymatous Organs, Surg., Gynec. & Obst. **37**: 694-695 (Nov.) 1923.

3. These publications include:
André, P.: Indications in Bilateral Reno-Ureteral Calculi, French Congress on Urinary Calculi, 1931.
Braasch, W. F., and Culligan, J. L.: Multiple Renal Stones: Problems in the Treatment of Patients, with this Condition, Arch. Surg. **17**: 259-278 (Aug.) 1928.
Cabot, Hugh: Modern Urology, Philadelphia, Lea & Febiger **2**, 1924.
Cabot, Hugh, and Holland, W. W.: Nephrostomy: Indications and Technic, Surg., Gynec. & Obst. **54**: 817-825 (May) 1932.
Geraghty, J. T.; Short, J. T., and Schanz, R. F.: Multiple Renal Calculi, Unilateral and Bilateral, J. A. M. A. **77**: 901-903 (Sept. 17) 1921.
Hamer, H. G.: Renal and Ureteral Calculi: Present-Day Surgical Problems, Am. J. Surg. **13**: 96-103 (July) 1931.
Hunner, G. L.: Calculus of the Urinary Tract; End Results, Tr. South. S. A. **40**: 1017, 1927.
Keyes, E. L., Jr.: Problems Concerning Urinary Calculi, Am. J. M. Sc. **161**: 334 (March) 1921.
Leschnew, N. F., and Levant, D. E.: Bilateral Calculi: Diagnosis and Surgical Treatment, Ztschr. f. Urol. **24**: 17-30, 1930.
Mamikonoff: Problem of Simultaneous Bilateral Nephrolithotomy or Pyelolithotomy, Ztschr. f. urol. Chir. **33**: 506-510, 1931.
Moere, F.: Bilateral Calculi: Diagnostic Indications and Treatment, Med. Klin. **27**: 1417-1423 (Sept.) 1931.
Rettig, W.: Bilateral Calculi: Treatment, Arch. f. klin. Chir. **158**: 533-542, 1930.
Rosenstein, P.: Surgical Treatment of Bilateral Calculus, Deutsche Ztschr. f. Chir. **225**: 215-228, 1930.
Schuessler, H.: Operation for Bilateral Coral Calculi, Deutsche Ztschr. f. Chir. **228**: 307-311, 1930.
Young, H. H.: Practice of Urology, Philadelphia, W. B. Saunders Company **1**: 413, 1926.

in the other kidney, which had been operated on elsewhere two years earlier. There was one patient who passed spontaneously bilateral ureteral calculi following cystoscopic manipulations. Three of the excluded group were operated on by us on one kidney only, after nephrectomy elsewhere for calcareous pyonephrosis.

Fig. 1.—Simple roentgenogram of a woman, aged 40; much pain in the left flank for the past two weeks; similar attacks for four years. There was no urinary disturbance. Marked tenderness of the left kidney, with fair function and some infection; the right ureteral orifice was not found; no indigocarmine was seen in twenty minutes; an intravenous urogram showed good output from the left kidney and none from the right. Large calculi in the lower right ureter and stag-horn calculus in the left kidney. Pain and tenderness in the left kidney became less in the hospital. Right ureterotomy was done, with removal of two calculi. Intravenous urograms two weeks after operation showed slight excretion from the right kidney. The operation was done on the side showing poorer function and not on the painful side. The object was improvement of total renal function by ureterolithotomy, an operation of little risk. Later operation was advised on the left kidney.

In only three instances were simultaneous bilateral operations performed; all the patients survived. This bilateral procedure is preferable in young and robust patients who are good operative risks, and with rapid operations not requiring extensive nephrotomy. Hryntschak [4] has reported seven one-stage operations in fifteen bilateral cases. The advantages of one over two operations are evident: shorter stay in the hospital, briefer convalescence, less expense, and the like. However, most of our patients apply for treatment late and are in poor condition.

There were five deaths after the first operation performed on the other thirty-two; four among the first twenty-one and one among the eleven seen during the past five years. These will be reported critically but briefly, particularly to discuss the treatment in certain cases:

Case 1.—A man, aged 54, who was very ill, with stones in both kidneys, died three days after simple incision of a perinephric abscess. No attempt was made to do anything to either kidney. His nonprotein nitrogen was over 200 on the day of operation.

Case 2.—A man, aged 43, died from shock following a difficult intracapsular nephrectomy through the scar of a former kidney operation. There was a long history of frequent colic on both sides, a litholapaxy and the renal lithotomy already noted. He had had recent severe pain on the operated side, which showed infection and reduced function without any evidence of ureteral obstruction. The better kidney contained a large stag-horn calculus. We believed the painful kidney to be of little real value and operated to relieve symptoms. The error was in surgical judgment; the operation was prolonged to tie a large vascular pedicle because of the optimistic report on the general condition (not justified) given by the anesthetist.

Case 3.—A man, aged 34, died on the fifth day following removal of the very adherent right pus kidney, as the result apparently of extreme abdominal distention. The patient had a large dendritic calculus in the right kidney, which gave thick pus, no urea and no dye; there was a large rounded calculus in the left kidney, the excretion from which contained no pus and yielded a good urea percentage and phenolsulphonphthalein in seven minutes. We elected to remove the worthless kidney, which was causing pain. I believe it would have been wiser simply to drain this kidney by nephrostomy to relieve infection and pain and then remove the calculus by pyelotomy from the left kidney before attempting right nephrectomy.

Case 4.—The fourth death occurred three days after pyelotomy with removal of a stone. A man, aged 53, was admitted in 1923 with anuria of twenty hours' duration, following a drunken debauch. Indwelling ureteral catheters brought urine from both kidneys and were left in situ for three days, at which time the patient insisted on going home. Normal urination continued for four days only and was followed by three days of anuria. The patient returned to the hospital, and bilateral catheters were again introduced. The next day the nonprotein nitrogen was 84 mg. per hundred cubic centimeters of blood, and creatinine was 4.5. Five days later (the catheters having been withdrawn) the nonprotein nitrogen was 230, and catheters were

Fig. 2.—Intravenous pyelogram before operation (same case as in figure 1).

reintroduced. Several phenolsulphonphthalein tests done at various times gave zero output in two hours. Roentgenograms showed small shadows at the ureteropelvic junctions on both sides. Several times the catheters were withdrawn, anuria ensued, and the catheters were reinserted. But the cystoscopic treatment could not be continued indefinitely. On the twenty-fifth day in the hospital, the nonprotein nitrogen was 56 and

4. Hryntschak, T.: Operations in One Sitting for Bilateral Calculi, Deutsche Ztschr. f. Chir. **225**: 229-241, 1930; Operative Treatment of Bilateral Nephrolithiasis, Surg., Gynec. & Obst. **58**: 103-112 (Jan.) 1934.

creatinine 3.2, the best report on the record. The situation was desperate, but some type of drainage was urgently needed. I doubt whether any operation would have saved this man, but, theoretically, with our present views, rapid bilateral nephrostomy would seem indicated and undoubtedly would have been permanent. However, we operated on one side only and performed right pyelotomy with removal of one obstructing stone; considerable perinephric edema was noted. Autopsy revealed a small right kidney with recent perinephritis and calcareous

Fig. 3.—Simple roentgenogram of a man, aged 31, who had no pain or urinary symptoms, the general symptoms, including high blood pressure, headaches and flushing of the skin. Function tests of the right kidney were little better than the left. Total phenolsulphonphthalein output was 25 and 15 per cent for two hours; nonprotein nitrogen and creatinine of the blood were normal. Multiple calculi of both kidneys were found, with large stones in both pelves. Left pyelotomy and multiple nephrotomy incisions were done; more than 200 stones were removed. Oliguria occurred, followed by death on the third day after operation.

incrustations in the thickened wall of the corresponding ureter, 2 cm. below the pelvis; the left kidney was large and badly infected, and there was an obstructing calcific deposit at the ureteropelvic junction.

CASE 5.—The most recent death (1931) followed three days after left pyelotomy and multiple nephrotomy performed on a man, aged 31 (fig. 3). More than 200 stones were removed. Judging from the roentgenograms, the other kidney contained as many calculi. Before operation the nonprotein nitrogen was normal and the total phenolsulphonphthalein output was 20 per cent and 20 per cent for the first two hours. The kidneys were of about equal functional value. Postoperatively, in spite of the administration of much fluid, the urine output was very scanty; the nonprotein nitrogen rose steadily and the patient died on the third day.

In case 5 we were influenced by the youth of the patient, the presence of symptoms indicating renal insufficiency in spite of apparently satisfactory tests, and the dismal prospect without operation. The grave risk was appreciated, but we hoped to prolong life and make it more comfortable. It is now obvious that too much was done. We should not have undertaken more than the removal of the large pelvic stones and drainage of the kidneys at first, if indeed we should have operated at all. Although complete removal of all stones in such a kidney is well nigh impossible, we were led to attempt it by the fairly satisfactory function tests on the one hand and the desperate outlook on the other.

Only eleven of the twenty-seven patients with bilateral calculus who had survived operation on one stone-bearing kidney or ureter came to operation on the other side. It was advised in many other cases but declined by the patients because of lack of symptoms. The second operations were performed at intervals varying from seventeen days to a year after the first operations. As a rule, the procedure consisted of removal of calculi and drainage. Nephrectomy was required but once; recovery was rapid. Only nephrostomy was done on the second kidney but once; the opposite kidney had failed to resume function after ureterotomy for obstructing calculus three months earlier, and it was impossible without grave risk to remove the multiple and stag-horn calculi from the second kidney, which was tightly embedded in a mass of tough fibrous tissue. This patient is still in the hospital, walking about, two months after operation, and he will be sent home wearing a nephrostomy tube.

Most of the eleven patients had an easy convalescence after operation on the second kidney. There were two deaths, however, and I would stress their parallel histories. Both patients were admitted in a precarious condition, as they had failed to return for the second operation until driven to the hospital by pain due to calculus obstruction and infection of the kidney. One died (in 1921, a year after the first operation) of renal insufficiency and infection eighteen days after removal

Fig. 4.—Simple roentgenogram of a man, aged 36; many stones were passed, following ureteral colic on both sides during the past year; for four months he had been in another hospital with acute multiple arthritis, septic temperature and frequent right renal colic with passage of stones; very ill on admission. Thick pus from the right ureter and practically no function of the right kidney; little pus from the left kidney and fair function. Total phenolsulphonphthalein output 25 and 15 per cent. Large groups of calculi in the right kidney and many small stones in the left. Right nephrectomy was performed, with prompt and marked improvement in the general condition and acute joint pains. During the next six months he passed spontaneously all but two stones from the left kidney. Total phenolsulphonphthalein output for two hours, eight months after operation was 58 per cent. The purpose of the operation was relief of acute sepsis.

of a stag-horn calculus through multiple nephrotomy wounds. The other returned to the hospital three months after right ureterotomy, with fever and acute

left-sided pain. He died nine days after pyelotomy for removal of stones from the left pelvis and upper ureter, drainage of a peripelvic abscess, decapsulation of the kidney, and drainage of cortical abscesses. There was suspicion of pneumonia before operation, but the signs were not clear and the need for relief of the kidney was urgent. Operation was done under spinal anesthesia. Pneumonia and empyema of the left side were evident some days later. Operation, before the onset of acute symptoms set in and not required as an emergency measure, would probably have led to an easy convalescence.

Fig. 5.—Simple roentgenogram of a man, aged 44; dull pain in the right flank for the past two or three weeks with no other history of pain or of any urinary frequency. Function of two kidneys about equal, slight bilateral infection. Two large calculi in calices of the right kidney, with faint diffuse shadows in the lower pole; one large calculus in the lower major calix of the left kidney, with diffuse shadow in the lower pole. No stone in either renal pelvis or ureter proved by urograms. Left nephrotomy was done for stone and resection of the lower quarter of the kidney for latent tuberculosis. The patient did not return for further observation. With no stone in either ureter or kidney pelvis, and with equal bilateral infection and equal function, the side requiring less surgery for stone (resection was not contemplated) was attacked first.

As an example of successful primary nephrectomy performed to relieve sepsis—the urgent need in this case—I cite the following: A man (fig. 4), aged 32, had suffered for months with multiple acute infectious arthritis and had a high septic fever daily. He had multiple renal calculi with infection on both sides, but fewer stones, much lighter infection and better function on the left. The right kidney was removed, with immediate relief of fever and the arthritis. However, there was no very large stone in the better kidney and none in the pelvis to cause obstruction, as was the case in the two patients who died following primary nephrectomy. To our amazement, most of the stones from the left kidney passed spontaneously during convalescence.

The following is of peculiar interest from the diagnostic point of view: A man, aged 32, showed by roentgenograms multiple calculi in the right kidney and one large stone apparently in the pelvis of the left kidney. Much more urine was obtained by catheter from the right ureter than from the left, and a larger amount of phenolsulphonphthalein was recovered from the right side. However, the percentage of urea and the concentration of the dye were much better on the left side. These observations were confirmed by a second cystoscopy. The conclusion was that the left kidney was of better quality than the right but very small. At operation an infantile kidney was found on the left side and the stone removed from its pelvis. The right kidney was immediately exposed and a large group of stones removed from that side. The patient went home comfortable and apparently in good condition but returned to the hospital in about six months and died of uremia twelve days after nephrostomy was done on the right side.

We had but one instance of nephrectomy required for hemorrhage following nephrotomy for calculus. In one patient (fig. 5), we resected the lower third of a kidney because of old tuberculosis, after removing stones from the upper part of the organ.

The relative functions of the two kidneys at the time of examination have been tabulated, the side of the first operation being noted. There were twelve primary ureterotomies for stones on the side of poorer function, as indicated by the tests (we compare the urea percentage and the output of phenolsulphonphthalein or indigo-carmine as a routine), and none on a side presenting better function. Primary pyelotomy (with additional nephrotomy at times) was done six times on the poorer side, four times on the better, and six times when the two kidneys gave equal function tests before operation. Primary nephrectomy of a poorer kidney was done three times. This is probably not good practice when a calculus in the other kidney is so situated that it may obstruct and particularly if it is possible to remove that calculus without mutilation of the kidney substance.

Fig. 6.—Bilateral calculi with double pyelograms (same case as in figure 5).

When pain in either kidney region was a complaint at the time of admission to the hospital, our reasoning as outlined has led us to operate on the painful side in most cases. Yet in three patients we deliberately operated first on the nonpainful side; and in one man

(fig. 7), with pain for six weeks in both kidney regions but distinctly worse on the right side, we first removed calculi from the left side and later performed right nephrectomy. All recovered.

Observations in the hospital after operation and such late examinations as we have been permitted to make have usually demonstrated great improvement in the function of the kidney involved after a definite obstruction was relieved. In one patient, however, we could

Fig. 7.—Simple roentgenogram of a man, aged 48; had had left pyelotomy for calculus twelve years earlier; calculi found in both kidneys four years ago, also pyuria and hematuria. For the past six weeks there was much pain in both kidney areas, worse on the right. The right kidney urine was thick with pus; function was almost zero; the left kidney was moderately infected, but function was good. Large dendritic calculus was found in the right kidney; multiple calculi in the left kidney. Left pyelotomy and four nephrotomy incisions were done for removal of the calculi. Two small pieces of stone remained. Nonprotein nitrogen and creatinine rose from 45 and 2.2 before operation to 100 and 4.3 on the tenth day after operation and dropped to 37 and 1.5 on the twenty-fourth day. Five months later right nephrectomy of pyonephrotic kidney was done. Phenolsulphonphthalein output for two hours, before first operation was 45 and 20 per cent; best after first operation, 20 and 15 per cent; four years after both operations, 30 and 5 per cent, and the urine free from pus; there was a very slight increase in the size of the two stones in the left kidney and the general health was excellent. The first operation was done for relief of the better functioning kidney, as later nephrectomy of other side was anticipated.

prove no function of a kidney after removal of a stone from the corresponding ureter; obviously the obstruction had existed too long and the kidney was destroyed. When no definite obstruction was present, the removal of renal calculi was not always followed by better function; indeed, sometimes after nephrotomy incisions the tests were worse than before operation.

Pain and hematuria are usually promptly relieved by operation for stone, as might be expected. Definite improvement in the infection of a kidney relieved of calculi is usually evident within a few weeks, particularly when care has been exercised to remove all stones and to leave good ureteral drainage at the time of operation. To insure this, we make it a practice to pass a large bougie down the ureter to the bladder in all cases. Those patients with urinary infection still present on discharge from the hospital should be given conscientious treatment by antiseptics, pelvic lavage with silver nitrate, and ureteral dilation to reduce the probability of the reformation of calculi.

To substantiate a claim of recurrent stones, one must as a routine examine by x-rays all patients who have had operation for calculus. This practice has proved to me how difficult it is to remove all of a group of small stones. X-rays employed at the operating table will help locate larger pieces but are of little assistance with small pieces and bits of sand. Fortunately, some of these smaller pieces will later pass through the wound or through the urinary channels. The retention of some of these remnants does not necessarily offer a bad prognosis. In some cases the growth of stones is so slow that observation by roentgenograms may indicate little or no increase in size over a period of years.

I have come to feel that commonly, in the absence of acute sepsis, the primary object at first operation should be the maximum improvement of the total kidney function without undue risk. This may mean simply drainage, nephrostomy or pyelotomy, but usually removal of a probably obstructing stone by ureterotomy or pyelotomy. Occasionally, acute infection is the outstanding problem. If I considered here all the possible combinations of large and small stones in one or both kidneys or ureters, with and without infection, a discussion would lead to multiple presumptive situations with a conclusion for each—a long series of formulas. Is it not simpler to fix securely in mind the underlying principles and apply them to each problem as it is presented? Again I say that the size, number and location of calculi, as revealed by roentgenograms, the total renal function, and the presence or absence of

Fig. 8.—Simple roentgenogram of a woman, aged 68, who had had many attacks of pain in the right flank for the past five years; calculi were passed three months ago following pains on both sides. Function of the left kidney was nearly twice that of the right, with no infection of either; large stone in the right pelvis and multiple jackstones and small bits in the right major calices; small stones scattered in the left kidney. Right pyelotomy was done and one nephrotomy incision, for removal of multiple calculi. Operation was not advised on the left side. Operation was done to improve the renal function and relieve pain, by removal of obviously obstructing pelvic calculus.

infection are more important factors than symptoms and the relative function of the two kidneys, in helping one to decide what to do and on which side to operate first.

SUMMARY

1. The conclusions presented here are based on a study of the literature and on a review of thirty-five cases of bilateral urinary calculi in which operation was performed.

2. Full history, careful general examinations and an especially painstaking and complete urologic examination are necessary.

Fig. 9.—Simple roentgenogram of a man, aged 40; entered medical wards with bronchitis; has had three attacks of renal colic, last one five years ago, but no urinary symptoms now. Total phenolsulphonphthalein output was 10 and 10 per cent for two hours; the right kidney showed slightly better function than the left. Multiple calculi in the right kidney and long one in the upper ureter; single stone in the upper pole of the left kidney and long one in the upper ureter; slight infection on both sides. Left pyelotomy and one nephrotomy incision; nine days later, function of the left kidney was more than twice that of the right, and general phenolsulphonphthalein output was 20 and 5 per cent. Seventeen days later right pyelotomy and multiple nephrotomy were done. In six months the general phenolsulphonphthalein output was 25 and 20 per cent. Operation was performed primarily for improvement of renal function and was done first on the side requiring the least damage to the parenchyma in removing calculi (and incidentally that with slightly lower tests).

3. Operation may not be advisable, or one may operate primarily on both sides or on one, depending on conditions.

4. One must not be blindly guided by rules and formulas—such as, operate first on the side of the better kidney, or of the worse kidney, or of the most recent pain—but the therapy proposed must depend on a clear knowledge of the objectives sought, immediate and remote, of the means of attainment of these objects and of the risks involved. I urge careful consideration of the relative dangers of various operations in a given case.

5. Data on a series of thirty-five operative cases of bilateral calculi especially illustrate the fallibility of commonly accepted rules.

6. One should seek improvement of renal functions, primarily and eventually, control of infection and alleviation of symptoms. The first motive is usually outstanding, but relief of acute infection may demand initial attention, even nephrectomy.

65 East Sixty-Sixth Street.

ABSTRACT OF DISCUSSION

Dr. John S. Lewis Jr., Youngstown, Ohio: There is no rule of thumb that will serve as a guide in the management of bilateral urinary calculi. Each case is a law unto itself. Dr. Stevens's keynote, "Render the greatest service at the least risk," is the only guiding rule to be accepted. I would make a plea for a more general use of nephrostomy in these very sick patients. In certain cases, permanent nephrostomy may be the only answer. After nephrostomy, which at first may have been considered as a permanent procedure, the benefit will be so great to the patient that further operative procedure may be considered with safety. Dr. Stevens has not considered nonopaque calculi. While the general principles apply, one has to exercise unusual caution, as the size, location and number of stones cannot be accurately estimated. In those cases of bilateral urinary calculi which occur as the result of disturbance of the function of the parathyroid gland, the stones are small and are scattered throughout the parenchyma as well as along the excretory channels. The stones are of calcium phosphate, multiple, bilateral, and usually small. Their arrangement is rather characteristic. These cases present the additional problem of correction of the underlying cause, which is a disturbance of the function due to a tumor of one or more of the parathyroid glands. This may be accomplished by surgery, which is very difficult, or by properly given and adequate irradiation. I cannot say that I agree with Dr. Chute as regards the results of irradiation in parathyroid disease. I feel that definite results are being obtained.

Dr. Moses Swick, New York: Dr. Stevens's presentation of this trying and often discouraging condition illustrates the serious nature of the disease. The usual life history is that marked by bilaterality, recurrence, infection and renal insufficiency. For these reasons and because of difficulties encountered in coping with this problem, every attempt at conservatism directed toward the maintenance of kidney reserve, both in the diagnosis and in the preoperative and postoperative care, must be made. Because practically all cases of bilateral renal calculi are for the most part composed of calcium phosphate and oxalate and are therefore radiopaque, retrograde pyelography not only becomes unnecessary in many of these cases but may be dangerous to an already compromised kidney reserve. Thus, in cases of bilateral renal calculosis in which in many instances

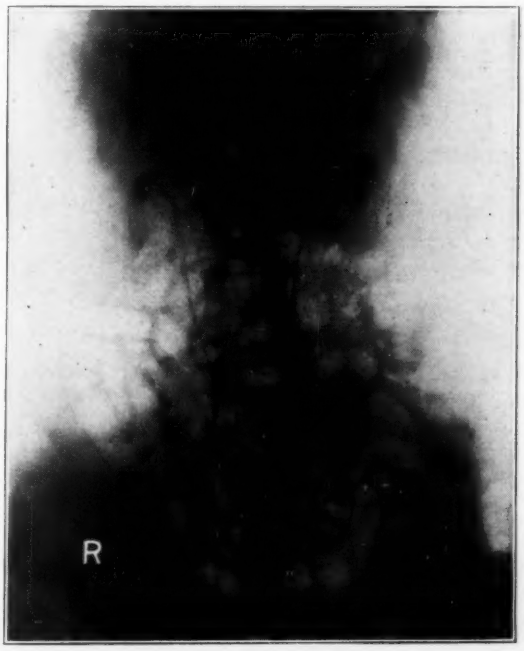

Fig. 10.—Simple roentgenogram of a man, aged 48, with occasional hematuria for six months but no pain. The function of the kidneys was good and equal, neither being infected. Medium nonobstructing stone in the right major calix; large stone in the left pelvis and major calix. Left pyelonephrotomy was done. The patient went home and did not return for operation on other side. The first operation performed on stone most apt to cause damage by obstruction.

the renal reserve is already compromised, retrograde pyelography may be the turning point in the death of the patient, in bringing about either uremia, urosepsis or both. Since in cases of bilateral renal calculi one frequently encounters the staghorn, soft and fragmented type, roentgen control at the operating table as an adjuvant in the handling of such cases becomes apparent. Only by this procedure can one evaluate the end results and hope for a total removal of the calculi at the time of operation. Furthermore, a clear insight into the general constitutional, laboratory and clinical status of the patient is important. Determinations of water and nitrogen balance, and the blood carbon dioxide, chloride and calcium content should be carried out, and therapy directed along these lines. The treatment of the patient should not cease with the operation but should be followed jointly by the metabolist and urologist along lines such as: 1. Exhibition of the vitamin A diet, considering the possible relationship of hyperparathyroidism to renal calculi. In this connection it might be helpful to consider also the possible relationship of phosphaturia and its causes. 2. The importance of constant forced intake of fluids. 3. The reaction of the urine and the chemical composition of the stone removed, which should be determined in order to prescribe diets and medications more intelligently. 4. Finally, in the presence of infection after removal of stones, use of the ketogenic diet.

PRODUCTION AND SOLUTION OF URINARY CALCULI

EXPERIMENTAL AND CLINICAL STUDIES

CHARLES C. HIGGINS, M.D.
CLEVELAND

Investigations dealing with the experimental production of urinary calculi have been reported in previous communications.[1] In a high proportion of albino rats maintained on a diet deficient in vitamin A, urinary calculi developed. If the deficiency in the diet was continued for a period of 250 days, 85 per cent of the experimental animals exhibited vesical calculi and 42 per cent showed renal calculi. The spherical, light brown calculi varied in size from 0.5 to 8 mm. in diameter. They contained calcium phosphate chiefly, with traces of carbonates and a small amount of mucoid substance. No oxalates or uric acid were detected.

METHODS OF PRODUCTION OF URINARY CALCULI

Three constant changes were observed in the experimental animals that might be associated with calculous formation. They are (1) keratinization of the epithelium of the genito-urinary tract, (2) urinary infection and (3) alkalinuria.

1. The keratinization of the epithelium is noted after the diet has been deficient in vitamin A for a period of from eight to ten weeks. This is not confined to the genito-urinary tract but involves also other mucous membranes, such as the trachea, bronchi and vagina.

This experimental study is in accord with clinical observations. Wilson and DuBois[2] in 1923 noted at autopsy that infants who had died from intercurrent infection associated with vitamin A deficiency demonstrated keratinization of the epithelium of the trachea, bronchi and other mucous membranes. Similar observations were reported by Mori[3] and recently, in necropsies on eleven infants who had vitamin A deficiency and died from some infectious process, Blackfan and Wolbach[4] found metaplasia or keratinization of the epithelium of the pelvis of the kidney and ureter in seven instances.

2. Urinary infection is produced in a large percentage of rats maintained on a diet deficient in vitamin A for long periods of time. Infection of the bladder occurs usually after thirty days and renal infection after from sixty to ninety days. When the experiments have progressed for from 200 to 250 days, 72 per cent of the rats have bladder infection and in 42 per cent of these there is a coexistent renal infection. The organisms isolated in dextrose brain broth were streptococci, staphylococci and mixed cultures.

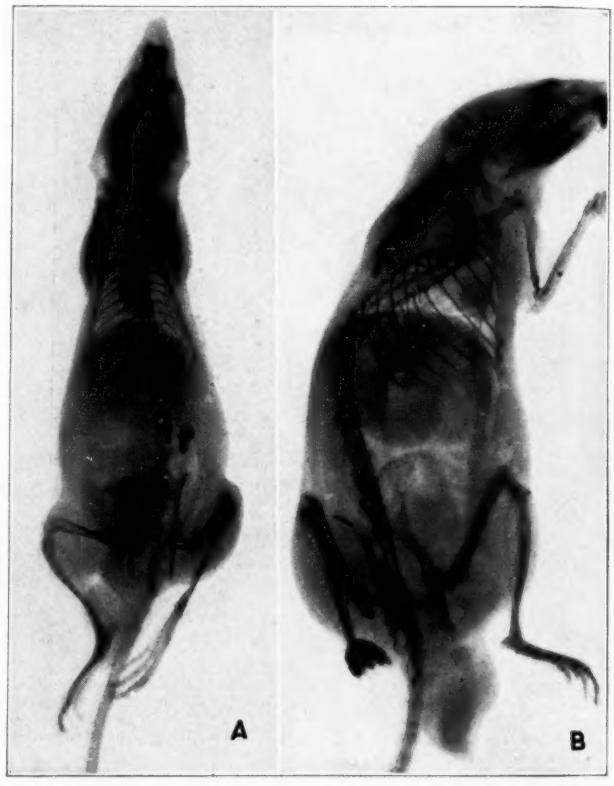

Fig. 1.—White rat, 187 days old: *A*, stone in bladder and two stones in kidney after diet deficient in vitamin A. *B*, disappearance of renal and bladder stones after high vitamin A feeding for a period of two months.

3. Alkalinuria is a constant finding in rats maintained on a diet inadequate in vitamin A. By the addition of ammonium chloride to the diet the incidence of calculi is decreased. Likewise, by adding vitamin A to the deficient diet the urine becomes acid and calculi are not produced.

SOLUTION OF URINARY CALCULI

It was demonstrated in earlier experiments that, if vitamin A alone was restored to the diet of rats, the formation of urinary calculi could be prevented. In order to determine whether stones already formed could be dissolved by the administration of vitamin A, thirty

---

From the Cleveland Clinic.

Read before the Section on Urology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

1. Higgins, C. C.: The Experimental Production of Urinary Calculi, J. Urol. **29**: 157-185 (Feb.) 1933; Experimental Production of Urinary Calculi in Rats, Urol. & Cutan. Rev. **38**: 33-39 (Jan.) 1934.

2. Wilson, J. R., and DuBois, R. O.: Report of a Fatal Case of Keratomalacia in an Infant, with Postmortem Examination, Am. J. Dis. Child. **26**: 431-446 (Nov.) 1923.

3. Mori, D.: Changes in Para-Ocular Glands Which Follow the Administration of Diets Low in Fat-Soluble A; Effect of Same Diets on Salivary Glands and Mucosa of Larynx and Trachea, Bull. Johns Hopkins Hosp. **33**: 357-359 (Oct.) 1922.

4. Blackfan, K. D., and Wolbach, S. B.: Vitamin A Deficiency in Infants: Clinical and Pathological Study, J. Pediat. **3**: 679-706 (Nov.) 1933.

rats with bladder or renal calculi were studied. Except for the addition of cod liver oil, the diet remained the same as when the calculi were produced.

Twelve rats with vesical calculi had the deficient diet for from thirty to sixty days. In eleven of these the calculi had entirely disappeared roentgenographically after two drops of cod liver oil had been administered daily for a period of from fifty to sixty days. The other rat died shortly after the experiment was started. Cultures taken when the rats were killed showed no evidence of urinary infection. Sand was present in the bladders of two rats. A mild degree of keratinization of the epithelium of the genito-urinary tract was present in seven rats; in the others the epithelium appeared normal.

In a second group of eleven rats that had been on the deficient diet for from ninety-six to 130 days, vesical calculi could be demonstrated roentgenographically, and coexistent renal calculi were observed in two rats. After the rats had been on the high vitamin A diet for ninety days (two drops daily), roentgenograms showed no evidence of calculi in the bladders of six rats. In the other five the calculi were definitely smaller. One of the renal calculi could not be demonstrated. Cultures from the bladder were positive for mixed infection in every animal of this series, and in three animals there was infection in the kidney. There was a large abscess between the bladder and the abdominal wall in one animal, but no other gross pathologic changes were noted in the genito-urinary tracts. Some degree of epithelial keratinization was present in all the rats in this series, but there was found to be evidence of repair of the stratified to normal epithelium in six rats.

The third group of twelve rats had been maintained on the deficient diet for a period of 180 days. Vesical calculi had been demonstrated in all these rats and renal calculi were present in two of them. In four animals the vesical calculi had entirely disappeared 101 days after cod liver oil (two drops daily) was added to the diet. In the remaining rats in this series the calculi were definitely smaller. In one the renal calculi also had disappeared (figs. 1 and 2). The rats were killed after 107 days, and organisms were isolated from the bladder in all instances. A pure culture of staphylococcus was found in two and mixed infection in the others. In eight of the rats a coexisting renal infection was found.

Cystitis, hemorrhage under the mucosa of the bladder and renal infection were common observations in this group. Keratinization of the epithelium was present to some degree in the genito-urinary tracts of all the animals in this series. A reparative process was evident in the epithelium of the ureters, kidneys and bladder, especially when there was not a marked degree of infection. Vesicular degeneration of cells and hemocytic infiltration above the layer of undifferentiated cells, as described by Wolbach and Howe,[5] were present in numerous instances.

These experiments show that with the addition of vitamin A to the diet there is a tendency toward restoration of the normal epithelium, along with solution of the calculi. In our first experiments at the clinic, the calculi produced in rats on a vitamin A deficient diet were composed chiefly of calcium phosphate, so it seems logical to assume that the calculi in this series of experiments were of the same composition.

CHEMICAL FACTORS IN THE FORMATION OF CALCULI

Schade[6] and other colloid chemists have described certain conditions necessary to the formation of calculi. These include precipitation of crystals from a supersaturated solution together with some organic colloid material, such as fibrin and mucin, which can form the nucleus of minute calculi. These, in the presence of stasis and infection, can accrete to stones of much greater proportions.

In vitamin A deficiency, then, are produced the essential conditions for calculus formation, the precipitation

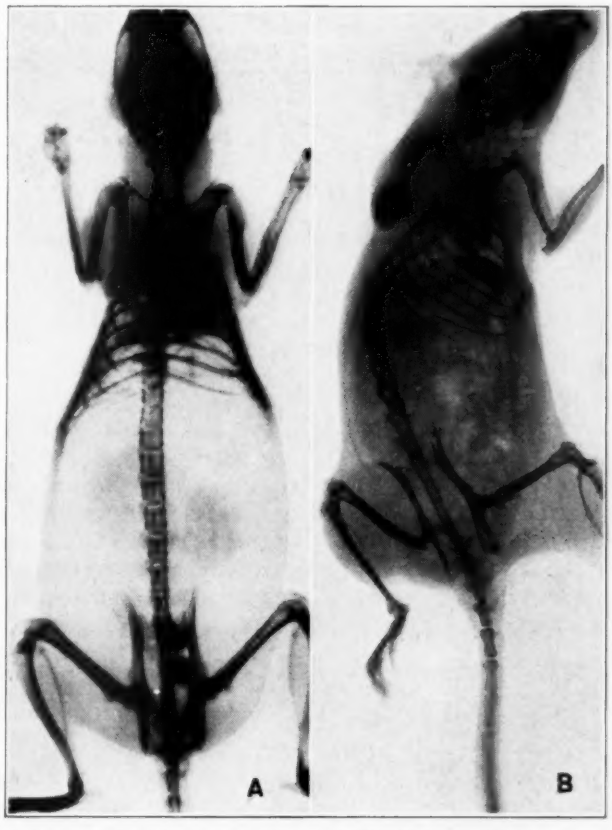

Fig. 2.—White rat, aged 192 days: *A*, two large lamellated stones in the bladder produced on vitamin A deficient diet. *B*, stones entirely disappeared after high vitamin A feeding for six weeks.

of crystals from a supersaturated alkaline urine and the formation of local irritation, sometimes to the point of ulceration, consequent to keratinization and desquamation of the epithelium of the urinary tract.

Precipitation, per se, causes sediment and not stones. Neither do the desquamated epithelial cells alone act as nuclei for the formation of calculi. But the keratinization of the epithelium causes sufficient irritation and local lesions producing fibrin and mucin to form a framework for the deposition of crystalline sediment and subsequent development of stones.

These factors explain the formation of urinary calculi in experimental animals deprived of vitamin A and also in patients who have had inadequate diets. Stone areas or regions in which urinary calculi are unusually prevalent have been noted by various clinical observers

5. Wolbach, S. B., and Howe, P. R.: Epithelial Repair in Recovery from Vitamin A Deficiency: Experimental Study, J. Exper. Med. **57**: 511-526 (March) 1933.

6. Schade, H., cited by Alexander, Jerome: Colloid Chemistry—Theoretical and Applied, New York, Chemical Catalog Company, Inc. **2**: 803-844, 1928.

and have usually been attributed to some rather general dietary deficiency peculiar to the region.

CLINICAL OBSERVATIONS

Since these experimental investigations were undertaken, it has been the routine procedure at the Cleveland Clinic for the last two years to administer to patients who have been operated on for urinary calculi a special acid ash diet high in vitamins, especially in vitamin A. Vitamin A is also added in the form of cod liver oil or halibut liver oil, a teaspoonful three times a day. The various capsules containing these sources of vitamin A, usually four daily, also may be used. Generally this diet suffices to render the urine acid. If the urine remains alkaline, neutral or only slightly acid, however, acidifying agents such as ammonium chloride or sodium acid phosphate are administered. The patient is instructed to test the urine morning and night with litmus paper, and on each visit to the clinic a urinalysis, including the p_H, is made. Of course other therapeutic measures, such as the eradication of renal infection or the elimination of stasis in the urinary tract, have not been neglected. On this regimen no calculi have recurred, but insufficient time has elapsed to warrant definite and final conclusions as to the efficacy of this prophylactic measure.

Fig. 4.—*A*, kidneys, ureters and bladder of a man, aged 59, showing right renal calculi. *B*, six months later there was a definite breaking up of the lower portion of the stone. *C*, ten months after beginning treatment there was a marked decrease in the lower portion of the stone. The patient has passed 323 small stones.

Seven patients with renal calculi, either unilateral or bilateral, who have refused operation or in whom surgical treatment was not feasible have been taking a similar diet. In each of two instances a small stone in the lower calix of the kidney, too large to pass spontaneously, has disappeared entirely within four months, according to roentgenographic examination. In two patients, multiple large bilateral renal calculi have decreased definitely in size within thirteen months. One of these patients never had passed sand or calculi in the urine until she had been taking the special diet for three months, and the urine is now continually loaded with sediment and small stones (fig. 3). Another patient had a large silent stone completely filling the left kidney. Operation was refused and, after the patient had taken the high vitamin diet for six months, 323 small calculi were passed (fig. 4). Previously this patient had never had colic nor had he passed sand or a stone in the urine. The other two patients have been on the diet for only a short time.

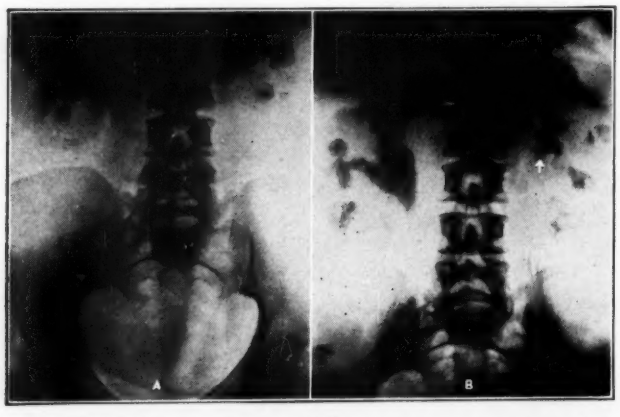

Fig. 3.—*A*, kidneys, ureters and bladder of a woman, aged 51, showing bilateral renal calculi. *B*, roentgen examination eleven months later showed decrease in large renal calculi in the right kidney. The patient has passed approximately 200 small stones.

Several other physicians have used the acid ash diet and vitamin A in the treatment of their cases, and the collected series in which calculi have disappeared now numbers eighteen. Detailed reports of these cases will appear in a later publication.

This series is too small and insufficient time has elapsed to permit definite conclusions regarding the clinical value of the method, but the outlook for medical treatment, at least in some cases of urinary lithiasis, seems promising.

SUMMARY

1. Urinary calculi develop in albino rats sustained on a diet deficient in vitamin A, and alkalinuria and keratinization of the epithelium of the urinary tract are constant observations. Infection of the urinary tract is frequent in the later stages of the experiment. The calculi are composed chiefly of calcium phosphate.

2. Addition of vitamin A causes disintegration and solution of the calculi experimentally produced in rats

3. The chemical conditions necessary for the formation of calculi are produced by vitamin A deficiency.

4. An acid ash diet high in vitamins, especially vitamin A, is suggested as a prophylactic measure to prevent the recurrence of calculi in patients who have had urinary lithiasis, and the rôle of vitamin A in the diet to prevent primary calculous disease is important.

5. A high vitamin, acid ash diet has produced a decrease in the size or total disappearance of renal calculi in patients refusing surgical intervention or in whom operation has not seemed indicated. In eighteen collected cases in which the high vitamin, acid ash diet has been used, the renal calculi have undergone solution, according to roentgenographic evidence.

ABSTRACT OF DISCUSSION

DR. VINCENT J. O'CONOR, Chicago: Much has been learned about the etiology of urinary stone. Keyser, among others, has pointed out the importance of metabolic influences. The disturbance of calcium and phosphorus metabolism associated with parathyroid adenoma has been emphasized by the Massachusetts General Hospital group this year. Holmes and Coplan showed the relation of excessive alkaline ash and acid ash diets in the etiology of urinary calculi. I have been tabulating the frequency of renal stone formation in patients who have observed a prolonged alkaline management for gastric and duodenal ulcer. This study covers a period of more than

fourteen years and comprises some sixty individuals. The persistent low grade alkalosis, with alkaline urine, seems to be the etiologic factor in the formation of small white crystalline calculi in these ulcer patients. The stones are composed almost entirely of calcium carbonate, an uncommon stone in the records of large series of analyses. Since the original presentation of Dr. Higgins's work two years ago, I have utilized his ideas clinically by having patients on alkaline powder treatment take halibut or cod liver oil in large doses. Several patients who had recurrent stones several times each year for several years (one had passed thirty stones in six years and all of them pure calcium carbonate) have had no evidence of stone during these two years, although being obliged to continue their ulcer management. An attempt should be made to institute a regimen for the prevention of recurrence. This includes not only the elimination of systemic focal infection, the correction of defective urinary tract drainage and the clearing up of urinary infection, but also the determination as to whether or not in a given individual the stone is the result of an excessive acid or alkaline ash diet. The analyses of the calculi help greatly in this, as does a study of the reaction of the urine when the patient is on various dietary managements. Clinical experience shows that the average physician advises every patient with urinary lithiasis to avoid meat, eggs and fats. In the case of the many patients who are forming stones in an alkaline urine, these are the foods they need most. The work of Dr. Higgins accentuates that from a metabolic point of view the dietary correction varies with the individual, depending on whether he is forming stones as a result of excess acid or alkaline ash. It is obviously as wrong to prescribe excessive vitamin A food in an individual forming acid ash stones as it is to alkalinize a patient further whose dietary ash residue is alkaline. The haphazard prescribing of excessive amounts of citrous fruit juices and prolonged ingestion of alkalis is not an aid to metabolic problems unless it is based on a careful study of the requirements for each individual under consideration.

RECURRENT UROLITHIASIS: ETIOLOGIC FACTORS AND CLINICAL MANAGEMENT

LINWOOD D. KEYSER, M.D.
ROANOKE, VA.

While the etiology of urolithiasis is far from clear, an attempt may be made at correlation of data from laboratory and clinical sources with an effort to ascertain what facts may be of value in the preventive therapy of recurrence.

Experimentally the production of calculi in laboratory animals may be recounted in the following ways:

1. By the feeding of oxamide.
2. By producing an artificial excessive excretion of calcium oxalate.
3. By excessive doses of parathyroid extract and of viosterol.
4. The formation of uric acid calculi in animals with Eck fistulas.
5. By feeding diets deficient in vitamin A.
6. By infection with urea splitting streptococci, staphylococci and B. proteus-ammoniae.
7. By the incrustation of organic or inorganic foreign bodies in the presence of infection.

The first four of these methods imply an aseptic metabolic disturbance associated with excessive excretion of urinary crystalloids. The rôle of infection in the sixth and seventh method of experimental calculus production is obvious. That the infection is specific is attested by the fact that organisms successfully used by different observers were isolated from the teeth, tonsils or urine of patients afflicted with active stone formation and that the use of strains of similar organisms from other sources gave negative results.

The mechanism of hyperexcretory calculosis (figs. 1 and 2) has been dealt with in numerous reports.[1] This mechanism takes one at once to the realm of physical chemistry. Lichtwitz [2] and Schade [3] have shown that the water insoluble constituents of stones (crystalloids) are held in a state of dispersion in the urine by adsorption to irreversible urinary protective colloids. In experimental animals I showed that an increased excretion of calcium oxalate resulted in first a precipitation of isolated octahedral, dumb-bell or tabloid crystals but that further intensification of the excretion of oxalate resulted in an inadequacy of the colloidal mechanism to maintain either solution or deposition of isolated crystals. In consequence, fusing clusters of coalescent spheroidal crystals were precipitated and stone formation took place (figs. 3 and 4). Especially in the case of oxamide calculosis pigment and organic matter, probably the gel of the irreversible colloid, accompanied the deposition of stone forming spherules and served to form the organic framework of the stone.

The mechanism of infectious calculosis is not so clearly demonstrable. Hager and Magath [4] felt that Proteus ammoniae formed calculi in bladders previously irritated by salicylic acid, through the process of splitting urea and depositing precipitates of magnesium ammonium phosphate and calcium carbonate on abraded mucous membranes. These precipitates tended to break off and form free calculi in the bladder. Likewise, in experimental streptococcic calculosis in rabbits (figs. 5 and 6), I have shown the initial lesion to be an impregnation of lime salts in necrobiotic cells of the mucosa. From this incrusted cystitis, free particles break away to grow as calculi. In one instance this process was most intensive even in the kidney pelvis and ureters. Thus from the experimental standpoint infectious calculosis seems related more to the deposition of lime salts in tissues, a process the chemistry of which has been much studied, with varying and somewhat conflicting opinions.

Vitamin A deficiency lithiasis has provoked much speculation. As a cause of stone, vitamin deficiency has been championed by the English school and in America Higgins [5] has presented evidence of its etiologic bearing on the disease. His observation that calculosis begins in rats before the advent of infection is illuminating. While I am hesitant to disagree with those who hold for a vitamin factor in lithiasis, a general survey of the subject reveals some points that I cannot rationalize with certain clinical facts.

In the first place, this type of stone formation has been noted chiefly in rats, a species rather remote phylogenetically from human beings. The ocurrence of urolithiasis is a late stage in a progressive state of malnutrition, other prominent and concomitant features of this malnutrition being biliary calculi, cachexia and

Read before the Section on Urology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

1. Keyser, L. D., and Braasch, W. F.: The Etiology of Urinary Lithiasis, Internat. Abst. Surg., January, 1922, pp. 1-10. Keyser, L. D.: The Mechanism of the Formation of Urinary Calculi, Ann. Surg. **77:** 210-222 (Feb.) 1923; The Etiology of Urinary Lithiasis, Arch. Surg. **6:** 525-553 (March) 1923; Urinary Lithiasis—Its Cause and Prevention. An Evaluation of Contributions to Our Knowledge During the Past Decade, South. M. J. **25:** 1031-1040 (Oct.) 1932; The Relationship of Urinary Infections to Recurrent Calculi, J. Urol. **31:** 219-238 (Feb.) 1934.
2. Lichtwitz, L.: Untersuchungen über Kolloide im Urin, Ztschr. f. physiol. Chem. **64:** 144-157, 1910; Die Bildung der Harnsedimente und Harnsteine, Ztschr. f. Urol. **7:** 810-820, 1913.
3. Schade, H.: Beiträge zur Konkrementbildung, München. med. Wchnschr. **56:** 77-80, 1909.
4. Hager, B. H., and Magath, T. B.: The Formation of Vesical Calculi, J. A. M. A. **90:** 266 (Jan. 28) 1928.
5. Higgins, C. C.: The Experimental Production of Urinary Calculi. J. Urol. **29:** 157-171 (Feb.) 1933.

changes in the cornea, in the retina, and in the respiratory and alimentary tracts. These concomitant features of experimental avitaminosis stone are certainly not common or even infrequent accompaniments of calculous disease as it is seen in America. Even children in whom the formation of stone is somewhat rare seldom present calculi and the general malnutritional changes associated with marked vitamin deficiency.

Furthermore, in the pathologic study of the urinary tract, keratinization of the epithelium is not a common finding with stone. Vesical calculus in boys in certain geographic areas, as Rumania, Dalmatia, the Canton province and the Indian Punjab, does seem to be related to a cereal diet deficient in vitamin A. However, children who are fed on a similar diet in other contiguous areas are singularly free from stone. The factors of infection and of excessive crystalline excretion are yet to be ascertained in this type of stone disease.

Since 1920, when I first began the intensive study of urolithiasis, I have had an opportunity to investigate personally several hundred patients afflicted with urinary stone in its various phases. In each instance a searching inquiry into the previous dietary has led to not a single striking case of vitamin or nutritional inadequacy. Many of these patients who had recurrent stone had at some time lived largely on a diet of milk, eggs, fruit and vegetables, which, while adequate in vitamin content, did produce an alkaline urine of more or less intense degree. Milk alone seemed to aggravate the process in certain instances. This is significant in that milk, while rich in vitamins, furnishes an abundance of calcium and phosphorus and is a producer of alkaline urine. Certainly there is much to be learned before a vitamin deficient diet can be accepted as a cause of stone in the usual American patient.

Whether the urinary colloids may, under certain metabolic conditions, become inadequate to hold the normal amounts of crystalloids present in the daily urine output in solution and whether, in consequence

Fig. 1.—Hyperexcretory calculosis in a rabbit fed oxamide daily for seventeen days.

of this, stone may arise are possibilities concerning which there are no available data. The occasional occurrence of fibrin phosphatic stone is suggestive that fibrinogen, an abnormal colloid, may at times find entrance to the urinary stream and, in being precipitated to fibrin, be associated with calculus formation.

From the clinical side, evidence for the two types of calculosis, namely, hyperexcretory and infectious, is abundant. Uratic calculi are known to be associated with hyperexcretion of uric acid, cystine calculi with the abnormal appearance of a crystalloid foreign to the urinary tract. Recently the high incidence of calcium phosphate calculus in hyperparathyroidism has been noted by Barr, Bulger and Dixon[6] and in an especially interesting group of cases from the Massachusetts General Hospital by Churchill and Cope[7] and by Albright, Aub and Bauer.[8] Hypercalcemia, hypophosphatemia, hypercalcinuria and hyperphosphaturia, associated with excessive secretion of parathyroid extract, follows clinically an almost identical course

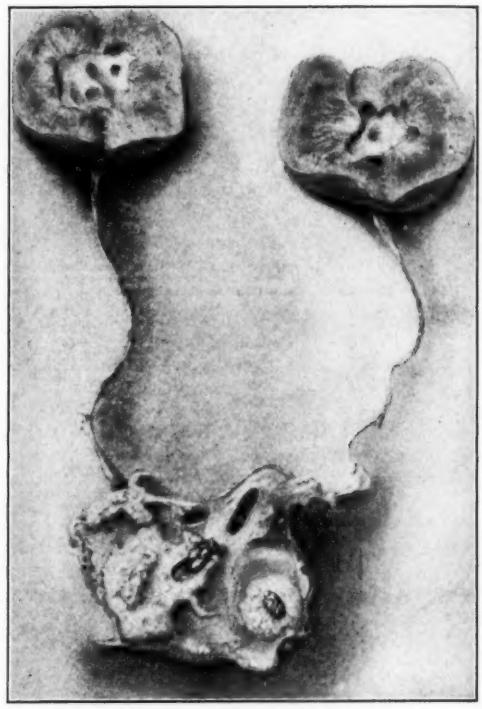

Fig. 2.—Hyperexcretory calculosis. Calcium oxalate stones in rabbit's bladder. Result of intense oxaluria produced by injection of N-butyl oxalate and calcium chloride.

with that which I have noted with intense calcium oxalate hyperexcretion in the experimental animal. Excessive crystalline material is excreted, even the renal tubules being clogged with lime salts. This phenomenon was likewise noted with artificial oxalate stone (fig. 4). Certainly hyperexcretory calculosis is approaching the point of establishment as a clinical entity, the chemistry of the stone with concomitant studies of the urine and blood leading to its possible diagnostic recognition.

Likewise the clinical evidence for calculosis from infection with alkaline urea splitting specific streptococci, staphylococci and Proteus organisms is abundant. The works of Rovsing,[9] Hryntschak,[10] Hellström,[11] Hyman,[12] Cifuentes,[13] Legueu and Coidan,[14] Lau[15] and

6. Barr, D. P.; Bulger, H. A., and Dixon, H. H.: Hyperparathyroidism, J. A. M. A. **92**: 951-952 (March 23) 1929.
7. Churchill, E. D., and Cope, Oliver: Parathyroid Tumors Associated with Hyperparathyroidism: Eleven Cases Treated by Operation, Surg., Gynec. & Obst. **58**: 255-272 (Feb.) 1934.
8. Albright, Fuller; Aub, J. C., and Bauer, Walter: Hyperparathyroidism, J. A. M. A. **102**: 1276-1286 (April 21) 1934.
9. Rovsing, C. M.: Infection as a Cause for Recurrence Following Operation for Kidney Stone, Acta chir. Scandinav. **57**: 387, 1924.
10. Hryntschak, T.: Ueber der Rolle der Staphylokokken fur die Entstehung der sekundären Harnsteine, Klin. Wchnschr. **12**: 63-65 (Jan. 14) 1933.
11. Hellström, J.: Einige Erfahrungen über Anstehung, Wachstum und spontanen Abgang von Nierensteinen, Ztschr. f. urol. Chir. **18**: 248, 1925.
12. Hyman, A.: Albumin, Fibrin and Bacterial Stones, J. Urol. **19**: 551 (May) 1928.
13. Cifuentes, P.: Sur la récidive des calculs du rein, J. d'urol. méd. et chir. **26**: 289 (Oct.) 1928.
14. Legueu and Coidan: Les troubles d'evacuation de basinet et la récidive des calculs, Arch. urol. de la clinique de Necker **6**: 175, 1928.
15. Lau, F. T.: Recurrent Calculi in the Urinary Tract, J. A. M. A. **84**: 272 (Jan. 24) 1925.

others have shown the consistent association of stone forming pyelonephritis with bacterial infection.

From such a survey I feel that experimental evidence is now sufficiently correlated with clinical data to justify the acceptance of at least two mechanisms of stone formation as reasonably well established facts; first, metabolic hyperexcretion of crystalloids and, second, infection with biologically specific stone forming bacteria. The first mechanism will produce stones corresponding largely to Albarran's primary calculi, and the latter to secondary calculi of earthy phosphates and carbonates. Doubtless other mechanisms will also be shown to be at fault, each of them acting in some way to upset the solvent properties of the urinary colloids.

FEATURES OF RECURRENT CALCULI

The recurrence of calculosis following the removal of stone is estimated at from 4 to 25 per cent, varying with the series of cases reported. Judd and Scholl [16] and Braasch and Foulds [17] estimated 10.3 per cent recurrence in 1,413 cases of renal calculus, 11.8 per cent recurred following pelviolithotomy, and 24.3 per cent following nephrolithotomy. Small stones are more likely to be associated with recurrence than larger calculi. Branched stones seem more prone to recurrence than smoother varieties.

Certain individuals seem to be possessed of what may be termed "stone forming kidneys." Their calculi may recur at the same site or at different parts of the urinary tract, first one side being involved and then the other. The removal of calculi is only the starting point for a renewal of the stone forming process.

The most rapid stone formers are those with recurrent ureteral calculi, these probably arising in the kidney above. Another perhaps smaller group tend to confine calculosis to the kidneys and suffer repeated surgical removal of stones at intervals of from months to years. Recurrent vesical calculus is less frequent in incidence. As a rule, recurrent concrements are chemically distinct

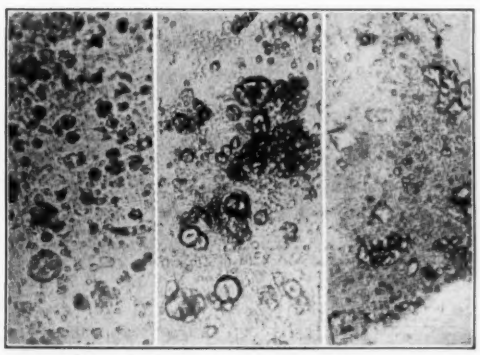

Fig. 3.—Hyperexcretory calculosis. Small calcium oxalate calculi experimentally produced and crushed on a slide to show crystalline elements in structure. The small fusing spheroids constitute the structural units.

and not mixed varieties and are of the same composition as their predecessors. Most frequently associated with recurrence are phosphates and carbonates. These are most often found associated with infection of coccic or bacillary type and are the variety most often noted with urostasis, such as vesical neck obstruction, hydro-ureter, hydronephrosis, ectopic kidneys and the like. There is no definite evidence, clinical or experimental, that urostasis alone will initiate stone formation, but urostasis does invite and maintain the existence of infection, and when this is a stone forming infection urostasis, by producing urinary stagnation, will produce rapidity of growth.

On the other hand, the evidence for recurrent aseptic calculus of the hyperexcretory type is being more frequently recognized as in the case of cystine and uratic

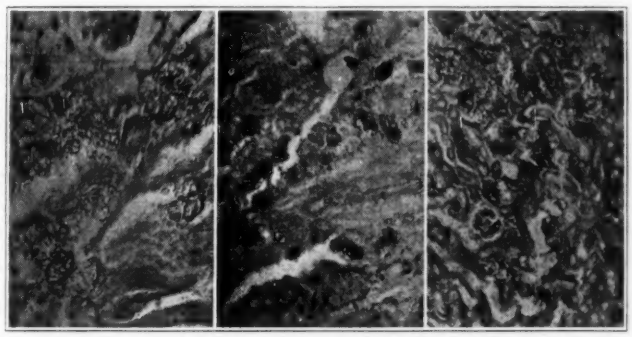

Fig. 4.—Hyperexcretory calculosis. Oxalate deposits in renal tubules associated with chemical nephritis. A consistent finding in experimental oxalate lithiasis.

calculi and more recently the calcium phosphate stones of hyperparathyroidism already mentioned. Just how often this type of calculus reforms is a question that one must wait for clinical investigation, probably in the near future, to answer.

MEASURES EMPLOYED IN PREVENTIVE THERAPY AGAINST RECURRENCE

Preventive measures against recurrence should be started with the removal of all stones as far as practicable by surgery or cystoscopy. At operation fluoroscopy or immediate kidney roentgenograms should be used, and the avoidance of exposure of suture material to the urinary stream and the insurance of proper urinary drainage should be practiced. In badly infected calculous pyonephrosis the utilization of nephrostomy as developed recently by Cabot is of value.

An immediate qualitative chemical examination of the calculus obtained should be made. A quantitative examination of the various constituents would be ideal but is hardly to be afforded by the average clinical laboratory. As urologic textbooks and manuals of laboratory technic seldom give definite directions for the analysis of calculi, I have modified an outline from two standard works on physiologic chemistry which can be carried out in any clinical laboratory and which has proved of value in my own experience. It is reproduced here in the accompanying table.

Repeated roentgenograms immediately and at periods of from six months to one year should be practiced. A careful study of the patient's metabolism should be carried out with every feature of laboratory diagnosis available. The blood uric acid and now the serum calcium and serum phosphorus seem to be additional data that should be secured as a routine and repeatedly, if one is properly to evaluate the incidence of hyperexcretory calculosis. If hyperparathyroidism is suggested, roentgenograms of the bones and other data pertinent to this disease should be determined.

Dietary regulation [18] with regard to the intake of purines, oxalates or calcium and phosphorus is indicated

16. Judd, E. S., and Scholl, A. J.: Renal Calculus, Collected papers of the Mayo Clinic and Mayo Foundation **16:** 303-313, 1924.

17. Braasch, W. F., and Foulds, G. F.: Postoperative Results of Nephrolithiasis, J. Urol. **11:** 525 (June) 1924.

18. Grant, O., and Simpson, V.: Food Content with Relation to Density and Composition of Stone in the Upper Urinary Tract, South. M. J. **23:** 628-635 (July) 1930.

A. Chemical analysis of stone removed.

A SIMPLE METHOD FOR THE QUALITATIVE ANALYSIS OF URINARY CALCULI

(Modified from Hawk and Bergeim—Physiologic Chemistry, and Hammarsten-Lehrbuch der physiologischen Chemie)

Each of the concentric layers of the calculus must be subjected to separate analysis. Material for examination is obtained by sawing the calculus carefully through the nucleus, then separating the layers, or by scraping off from each layer (without separating the layers) enough powder to conduct the examination as outlined below.

On heating the powder on platinum foil, it						
Does burn	Without flame	The powder gives the murexide test.*	The powder when treated with KOH gives	No noticeable ammonia reaction	Uric acid.
				Strong ammonia reaction	Ammonium urate.
		Does not give murexide test.* The powder dissolves in nitric acid without effervescence. The dried yellow residue becomes orange with alkali, beautiful red on warming.			Xanthine.
	With flame	Flame pale blue, burns a short time. Peculiar sharp odor. The powder dissolves in ammonia, and six-sided plates separate on the spontaneous evaporation of the ammonia.			Cystine.
		Flame yellow, pale, continuous. Odor of resin or shellac on burning. Powder soluble in alcohol and ether.			Urostealith.
		Flame yellow, continuous. Odor of burnt feathers. Insoluble in alcohol and ether. Soluble in potassium hydroxide with heat. Precipitated herefrom by acetic acid and generation of hydrogen sulphide.			Fibrin.
Does not burn	The powder when treated with HCl	Effervesces			Calcium carbonate.
		Does not effervesce	The powder gently heated, then treated with HCl	Effervesces	Calcium oxalate.
				The powder when moistened with a little KOH	No ammonia or, at least, only traces of ammonia. Powder dissolves in acetic acid or HCl. This solution is precipitated by ammonia (amorphous precipitate).	Bone-earth (magnesium and calcium phosphate).
					Abundant ammonia. The powder dissolves in acetic acid or HCl. This solution gives a crystalline precipitate with ammonia.	"Triple phosphate" (mixed with unknown amount of earthy phosphate).

* Murexide test: To a small amount of the powder in a small evaporating dish add 2 or 3 drops of concentrated nitric acid. Evaporate to dryness over a very low flame. A red or yellowish residue remains which turns purplish red after cooling the dish and adding a few drops of very dilute ammonium hydroxide. The color is due to the formation of murexide.

Blood chemistry studies—
Blood uric acid—serum calcium—serum phosphorus.

B. Uratic calculi—Low purine diet*—
Intense alkalinization of urine.
Calcium oxalate calculi—
Low oxalate dietary.*
Intense acidification of urine (p_H 4-5) (calcium oxalate is precipitated in wide range of urinary reaction).
Calcium and ammonium magnesium carbonate and phosphate calculi—
Low phosphate dietary.*
Intense acidification of urine (p_H 4-5).
Cystine calculi—
Intense alkalinization of urine.

For H-ion determination use indicator with color card, such as LaMotte Duplex Indicator (LaMotte Chem. Products Co., Baltimore).
Use methyl red—p_H below 5.5.
red paper / Yellow—p_H above 5.5.
—Patient may be taught to use this—

C. To acidify urine—ACID ASH DIET—

Bacon	Corn	Egg	Oatmeal	Rice
Bread, white	Crackers	Fish	Oysters	Sardines
Bread, whole wheat	Cranberries	Salmon	Peanuts	Shredded wheat
Cheese	Cream, whole	Meat	Prunes	Walnuts

Dilute nitrohydrochloric acid (aqua regia).

℞ Conc. nitrohydrochloric acid..... 10 cc.
Distilled water q. s. ..... 100 cc.
Take 1 drachm in 1 glass water every one to two hours to tolerance. Sip through tube and rinse mouth with sodium bicarbonate solution after taking.

Ammonium chloride—6 to 10 Gm. daily—enteric coated tablets } Watch stool to be sure enteric coated tablets are absorbed.
Ammonium nitrate—6 to 10 Gm. daily—enteric coated tablets } If not, use drugs in suitable liquid vehicle.

D. To alkalinize urine—ALKALINE ASH DIET—

Almonds	Carrots	Currants, dried	Melons	Potatoes, sweet
Apples	Cauliflower	Lemons	Onions	Potatoes, white
Asparagus	Celery	Lettuce	Oranges	Radishes
Bananas	Chestnuts	Milk, whole	Peaches	Raisins
Beans	Coconut	Molasses	Pears	Rutabagas
Beets	Cucumbers	Mushrooms	Peas	Turnips
Cabbage				

Magnesia, potassium citrate or acetate, sodium bicarbonate.

E. To Treat the Urinary Tract Infection—
Cultures at initial urologic examination.
Ketogenic diet for bacillary infection (A. L. Clark, J. Urology **31**: 193 [Feb.] 1934).
Methenamine—keep urinary reaction below p_H 5.6. Neoarsphenamine for coccic infections.
Reduce focal infections—teeth—tonsils—prostate—cervix—alimentary tract.
Surgical drainage or periodic cystoscopic lavage with a view to correcting urostasis.
Lavage with 1 to 2 per cent phosphoric acid or malic acid† may aid in dissolving incrustations or minute fragments.
Start with weaker solutions to test tolerance of patient.

F. Increase Vitamin A Intake—
Sources—Cod liver oil—halibut oil—Carotene in oil (provitamin A or carotene).

Foods—	Milk	Eggs	Tomatoes	Oranges	Pineapples
	Butter	Vegetables, with green	Bananas	Peaches	Prunes
	Cheese	or yellow pigment			

* An excellent series of diets are listed in an article by Grant and Simpson: South M. J. **23**: 628 (July) 1930.
† Malic acid (inactive)—A. H. Thomas Company, Philadelphia.

according to the predominant chemical found in the chemical analysis of the calculus. A high intake of vitamin A should receive further clinical trial, as first suggested by Kearns and Turkeltaub. I have used vitamin A drugs and diet as a routine procedure during the last four years.

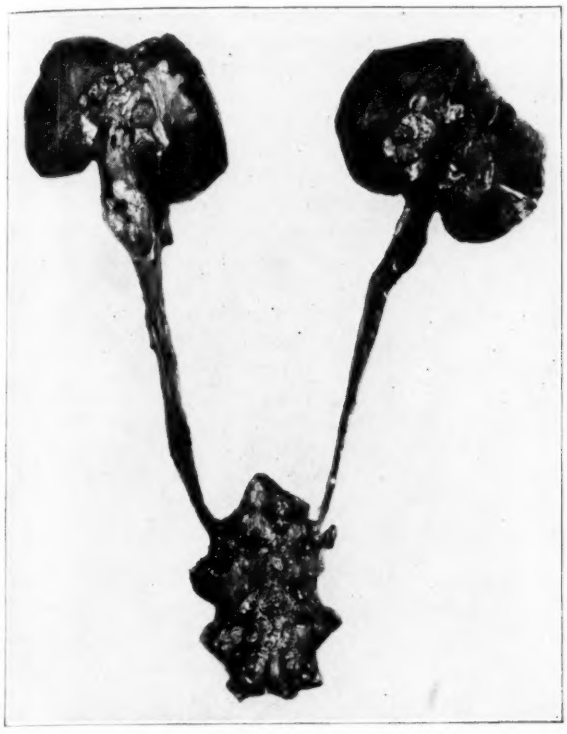

Fig. 5.—Infectious calculosis produced by infection of rabbit's bladder with streptococci from the urine of a stone forming patient. Note encrusted cystitis, dilated ureters and pyonephrosis five weeks after infection.

After every effort has been made to correct the metabolic disturbance present, an intensive and persistent effort to eradicate or to reduce to a minimum the infection should be made. Initial and repeated bacteriologic studies of the urine are imperative. The rôle of focal infection is not clear. Just why teeth infected with streptococci should produce a stone forming infection when Proteus, colon bacilli or staphylococci are found in the urine is difficult to explain, unless one considers the latter organisms secondary invaders. I agree with Hunner [19] that the chief object of attack is urostasis, and I practice periodic postoperative lavage as a routine with the free use of indwelling catheters and ureteral dilation of bulbs up to 16 F. In spite of sharp controversy concerning this procedure, I feel that it is one of the best therapeutic measures in treating any type of chronic nontuberculous urinary infection. Antiseptic drugs may aid, especially methenamine if the p_H is kept below 5.6. Neoarsphenamine in certain instances of coccic infection may be tried at times with success.

Finally, the reaction of the urine should be shifted to the opposite of that which is ideal for deposition of the stone. This will mean intense acidification of the urine in the case of oxalatic, carbonate and phosphate calculi, while alkalinization will be indicated with uratic and cystine varieties. The urinary reaction should be made in terms of the hydrogen ion concentration, numerous small determinators such as the one put out by the LaMotte Company being available for office use. If such apparatus is not at hand, the use of methyl red paper as an indicator is of value.

The hydrogen ion concentration of the urine is a great factor in aiding the urinary colloids to maintain solution. That acid urines are clear and alkaline urines are clouded with phosphates and carbonates is a matter of common knowledge, and each chemical constituent of stone has its ideal range for crystalline precipitation. In maintaining an intense acidity ammonium nitrate and chloride, dilute aqua regia, and the ketogenic or an acid ash diet are available and usually will bring the urinary reaction to a point below p_H 5, this being only slightly influenced by the morning alkaline tide and that following ingestion of food. A diet rich in acid ash may be used if this does not interfere with other dietary considerations already mentioned. The ketogenic diet affords in addition to its urinary acidifying properties the best antiseptic for bacilluria, as has been demonstrated by Helmholz and Clark.[20] In many cases it acts almost as a specific for this type of infection and with acidifying drugs pushed to the point of gastro-intestinal tolerance will possibly dissolve crystalline material and minute fragments. The coccic infections are most persistent and respond poorly to any treatment with which I am familiar. Neoarsphenamine intravenously will occasionally give a brilliant result.

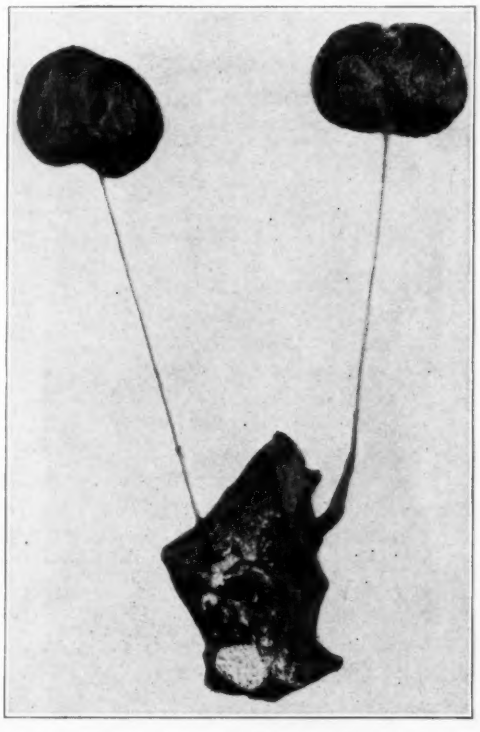

Fig. 6.—Infectious calculosis produced by instillation of streptococci from the urine of a patient with a stone forming kidney four weeks after infection. The process appears to start with a deposition of lime salts in necrobiotic epithelium.

On such a basis I have treated seventeen cases of recurrent calculosis, sixteen of which I reported in detail last year. The seventeenth case, a patient with recurrent phosphatic ureteral calculi, has been free from stone now for one year and may be added to the group.

19. Hunner, G. L.: Calculus of the Upper Urinary Tract, with Special Consideration of Recurring Stone Formation, Tr., Western Branch, American Urological Association **2**: 65-87, 1933.

20. Clark, A. L.: The Ketogenic Diet in the Treatment of Urinary Infections, J. Urol. **31**: 193-205 (Feb.) 1934.

These patients presented the syndrome of recurrent calculosis in intense degree and the cycle of their recurrence has been definitely broken for periods of from one to nine years. None of the seventeen have had a recurrence during the past year. Eleven are absolutely free from pus and bacteria in the urine. A minor degree of infection persists in six. Whether these results can be repeated and maintained in a larger series of cases remains for the future to show; I feel, however, that this type of clinical management sets a precedent in breaking the cycle of recurrent stone which has not hitherto been attained.

THE POSSIBILITY OF DISSOLUTION OF CALCULI

Recently interest has been revived in the possibility of dissolution of calculi. Randall's [21] introduction of phosphoric acid in the treatment of incrustations and of small fragments is noteworthy and a distinct contribution to the subject. My own experience with phosphoric acid in solution of from 1 to 2 per cent has not been encouraging, as I have had several severe reactions from renal lavage with this drug.

During the past year I have studied the solution of stones of the phosphatic and the carbonate type in

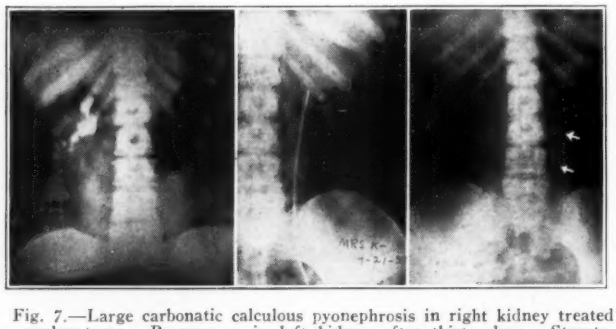

Fig. 7.—Large carbonatic calculous pyonephrosis in right kidney treated by nephrectomy. Recurrence in left kidney after thirty days. Streptococcic infection. Reduction in size of calculous mass with two small fragments remaining after thirty days of urinary acidification and pelvic lavage with phosphoric acid.

the test tube with a series of weak organic acids. These included tartaric, lactic, malic, citric, acetic and trichloracetic acids in various combinations. A study of the solvent action of caroid, pepsin and urea alone and in combination with these acids in dilutions of from 1 to 3 per cent has also been made. While these studies are to be reported elsewhere, I may say briefly that all these acids exert a moderate solvent action at incubator temperature. Much depends on the density of the stone, however. The outer layers dissolve as a rule rather rapidly, but as the inner layers and nucleus are approached one reaches a point at which dissolution is much delayed or brought to a standstill. One phosphatic calculus of 2,800 mg. was reduced to 1,800 mg. in twenty-four hours with a mixture of tartaric, malic and lactic acids, each in 1 per cent strength. Within wide limits not so much seems to depend on the acid used as on the density or compactness of the calculus.

Clinically it is difficult to apply acid solutions to the surface of calculi for any length of time by catheter irrigation. Continuous irrigation with phosphoric and malic acids has resulted after a short time in ureteral or vesical spasm, which becomes intolerable to the patient and invites a severe inflammatory reaction. Malic acid has been used satisfactorily in strengths of from 1 to 3 per cent in dissolving phosphatic incrustations and seems less irritating than phosphoric acid of similar strength and is, to my mind at present, the acid of choice. By mouth, Wise [22] found malic acid to be nontoxic in dogs and to be excreted from 20 to 40 per cent unchanged in the urine. In doses of from 8 to 16 mg. daily it is not, however, a good urinary acidifier, as the amount of alkali carried through from neutralization in the intestine tends to offset the acid portion that is excreted unchanged.

To Crowell [23] is acknowledged the distinction of first dissolving urinary calculi by purposive therapeutic means. In dealing with recurrent cystine calculi, he caused their dissolution by intense urinary alkalinization and renal lavage with alkaline drugs.

Three cases of partial or complete solution of stone in situ have been noted in my own experience, setting a precedent in the purposive dissolution of alkaline earth calculi. In the first, a woman suffered a marked recurrence of carbonate stones in a previously stone free and uninfected left kidney, three weeks after right nephrectomy for calculous pyonephrosis (fig. 7). The urine, which had previously been alkaline and loaded with amorphus carbonates, was acidified by dilute aqua regia, ammonium chloride and nitrate by mouth, along with an acid ash diet to p_H 4.5, where it was maintained over several months. Disintegration of calculi with the passage of multiple stones through the ureter ensued, with roentgen evidence of diminution of the calculous mass. A crystal clear urine was usually passed. However, two small fragments resisted ureteral dilation and lavage with 1 per cent phosphoric acid, until finally pelviolithotomy had to be done. Urinary acidification with postoperative renal lavage has been carried out over eighteen months. The patient has had no further recurrence but still presents a stone forming streptococcus in the urine that produces calculosis in experimental animals. The case is strong evidence for the prevention of recurrent alkaline earth stone by maintenance of acid urine.

A second case presented repeated recurrent phosphatic ureteral calculi of small size. Urinary acidification in a similar manner quickly brought about dissolution of a small ureteral calculus, and the patient has remained stone free over three years.

A third patient, a man, aged 32, had a recurrent small phosphatic calculus in the left kidney after two years (fig. 8). A stone was present at the ureteropelvic juncture. Malic acid, an acid ash diet and ammonium nitrate by mouth together with renal lavage with 2 per cent malic acid visibly reduced the stone in size roentgenographically, and after two weeks a small residual fragment was passed by way of the ureter.

Sufficient time has not elapsed and a sufficient number of cases have not been observed to furnish a positive evaluation of this treatment, but these occasional results are noteworthy and I hear of similar isolated cases from time to time. Dr. Higgins's excellent results with an acid ash high vitamin A diet are encouraging. The true significance of the vitamin A content is to my mind a matter yet to be evaluated. Progress along the line of solution of calculi is necessarily slow, and the ideal solvent has not yet been determined. However, from what has been learned of urinary calculus,

21. Randall, A.: Prevention of the Recurrence of Urinary Calculi, Am. J. Surg. **18**: 482-493 (Dec.) 1932.

22. Wise, L. F.: Elimination of Malates After Subcutaneous Injection of Sodium Malate, J. Biol. Chem. **28**: 185 (Dec.) 1916.

23. Crowell, A. J.: Cystine Nephrolithiasis: Report of Case with Roentgenographic Demonstration of Disintegration of Stone by Alkalinization, Surg., Gynec. & Obst. **38**: 87-91 (Jan.) 1924.

it is possible now to make purposive efforts in the therapy of dissolution, especially in cases of bilateral alkaline earth calculi or stones in single kidneys when operation would be hazardous.

In looking to the future, one may approach the problem of urolithiasis with more confidence than has been done in the past. The hyperexcretory and infectious types of lithiasis are almost certainly established as clinical entities. Research is being actively carried out to show the relationship of vitamin deficiency to the disease. A newer concept of the rôle of urostasis is being brought forth. As to the reasons for form, size, rate of growth and site of calculus deposition, it is necessary as yet to speculate. The conditions determining these features of calculous disease are beyond present comprehension but will doubtless be clarified when a better understanding of the physiochemical variations of this anomalous form of crystalline deposition is reached.

NOTE.—A word of warning should be given with regard to overzealous administration of urinary acidifying drugs. Occasional cases of acidosis and nephritis are noted. Hence, extreme caution should be used when the total amount of acidifying salt administered in twenty-four hours exceeds from 6 to 8 Gm. Even this dosage may be excessive if renal insufficiency is present.

Medical Arts Building.

ABSTRACT OF DISCUSSION

DR. GEORGE H. EWELL, Madison, Wis.: Vitamin deficiency produces marked changes in the urinary tract. Reddiwell published a paper several years ago on the possible relation of vitamin deficiency to leukoplakia and alkaline incrustation of the bladder. To my mind, Reddiwell's ideas are more applicable than those of vitamin deficiency to stone formation in the human being. Osborne and Mendel clearly pointed out in their experiments that in all cases in which the rats developed calculi they were without an adequate source of the vitamin for an extended period. I cannot believe that even in these times of economic distress our patients are so lacking in vitamins as the specific diet to which these laboratory animals were subjected. Fragments of stone left at operation have been very properly stressed. Dr. Stevens showed a slide of a case in which fragments had been left for six years without any further development. It is apparent that other factors play a part. The mechanism of the production of stone by stasis and infection is not known. The hypothesis that the stone forms around bacteria and desquamated epithelium as a nidus explains the appearance of only a few stones. The hypothesis that infection upsets the colloid-crystalloid mechanism of the urine explains a greater incidence of stone as due to infection and stasis. Alkalinuria has been considered to be due to the type of infection present. Dr. Clark stated that in many of his cases of chronic urinary tract infection, in spite of large doses of acidifying drugs, he was not able to change the hydrogen ion concentration very much to the acid side. I have observed several cases of chronic urinary tract infection in which, in spite of the administration of large doses of acidifying drugs, the urine remained alkaline. Those patients were subjected to gastric analyses and one patient was found to be lacking in free hydrochloric acid, with a low total acidity, while the rest had marked diminution in total acidity. Their urine promptly became acid when hydrochloric acid was administered by mouth. I believe that their urinary tract infection was a part of a general disturbance in metabolism and their alkaline urine due to the hypochlorhydria and not to the type of infection that happened to be present. Two years ago, before this section, I presented a paper on cystine nephrolithiasis. Cystine stones are often found in cases of recurrent urolithiasis, and cystine stones also occur in conjunction with other types of stones.

DR. FRANCIS P. TWINEM, New York: Dr. Keyser, who has been at the forefront of investigators in this problem, has covered this subject in a complete manner. Decades ago, Ord showed that he could change noncoalescent calcium oxalate crystals into the coalescent form by changes in the relative proportions of colloids and crystalloids in the urine, and Shattock later showed that the coalescent variety of crystals was at the basis of calculus formation. Deficiency in vitamin A is only one factor in calculus formation. It does not explain many vagaries of geographic distribution. Dr. Keyser stated that in Punjab, India, calculosis is exceedingly common, while in other districts, in which the diet is equally deficient in vitamin A, stones are rare. One geographic point that agrees with this idea, however, is that investigators among the Eskimos have said that they never saw a full-blooded Eskimo with a renal calculus. However, in Iceland, among the Norwegian population, in which the consumption of vitamin A is probably very high, stones are common. Any theory of calculus formation should also take into consideration the fact that stones are usually found in only one kidney. About 87 per cent of cases in the series that I studied in the New York Hospital showed stones only on one side. When one considers the

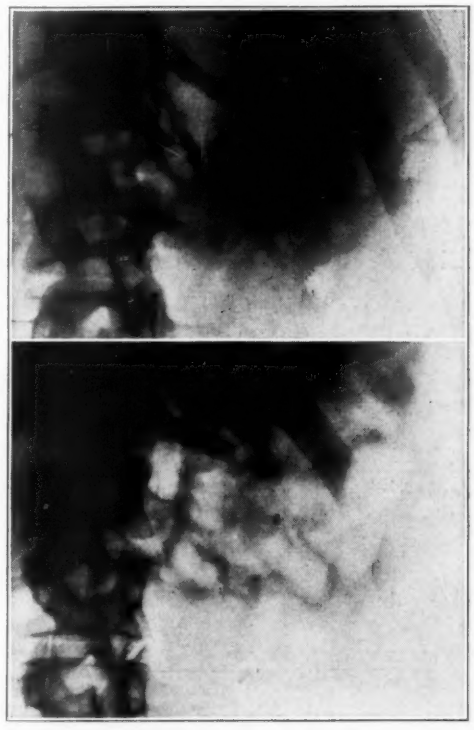

Fig. 8.—Recurrent phosphatic calculus at left ureteropelvic juncture. Intravenous urogram lightly retouched. Reduction in size of stone after one week of urinary acidification and lavage with malic acid. The patient passed a stone two weeks later with no other treatment.

factors of metabolic disturbances and vitamin A deficiency, one would expect that these factors would apply equally to the two sides. There must be some other factor involved to account for the frequency of unilateral involvement. As to the frequency of recurrent calculi, Rongiersma found nine recurrences out of sixty-one cases in aseptic stones. However, in cases of infection, the recurrences amounted to twenty-one out of thirty-nine cases. Rovsing found 40.3 per cent of recurrence in 109 cases. In the series of more than 200 cases that I investigated, the proportion is about 15 per cent of recurrence in the aseptic or but slightly infected cases, and about 30 per cent in the cases showing infection with urea splitting organisms. Rongiersma found that, in primary nephrectomy for unilateral calculous disease, recurrence occurred on the opposite side in only one case out of fifty-three. In these cases the metabolism of the individual was not changed at all; the same situation was still there as regards diet, and yet only one case out of fifty-three showed a recurrence of calculus. A large percentage of recurrence is due to wrongly preserving a badly infected kidney, a kidney infected with urea splitting organisms. I feel that a nephrostomy in an aseptic case is seldom indicated by reason of the fact that an infection nearly always supervenes. I wish to emphasize the

taking of roentgenograms on the table in cases in which there are several stones or a large, easily fragmented staghorn calculus. The analysis of the stone is important, and in my service we do this without exception. A patient whom I observed had six operations for phosphatic calculi. The urine was alkaline and was changed to acid. That patient has now gone a period of ten years without recurrence.

DR. LINWOOD D. KEYSER, Roanoke, Va.: Dr. Twinem has been rather insistent that there are probably a number of factors in calculus formation, and with this I agree. The attempt to centralize on one factor is likely to cause trouble. Dr. Randall of Philadelphia expressed an opinion at Atlantic City which is consistent with clinical and experimental facts. He felt that there must be dissolution of the mucous membrane at some point in the urinary tract, a point of irritation or of lowered resistance, before any type of calculosis can take place. I have long held a similar concept of stone disease. Whatever mechanism of stone formation is at fault, whether this is impregnation of lime salts in necrobiotic tissue as in the case of artificial infectious calculosis, whether it is keratinization of urinary tract epithelium as in the case of vitamin A deficiency stone, or whether it is crystalline hyperexcretion, in each instance there will be some pathologic change in the epithelium that is probably essential for the process. Such a concept may explain in some measure the unilaterality or bilaterality of calculi or their formation and recurrence at specific sites.

THE MEDICAL AND SURGICAL TREATMENT OF CALCULOUS ANURIA

GEORGE F. CAHILL, M.D.
NEW YORK

Calculous anuria, the term used to denote suppression of urine due to a stone in the kidney or ureter, occurs under the following circumstances:

1. Two secreting kidneys may have both ureters or pelves blocked simultaneously, either synchronously or one following the other.
2. A single secreting kidney may be blocked, the other (*a*) being imperfectly developed, (*b*) having been destroyed by disease or (*c*) having been previously removed.
3. Both kidneys or a double kidney may have a fused, single ureter, which may be blocked by a calculus.
4. Two kidneys apparently normal may have one kidney blocked and the other failing to secrete reflexly, the so-called renorenal reflex block.

I have added twenty-two cases from the Squier Urologic Clinic to the collection of 355 cases obtained from the literature by Rubritius. On his basis of analysis these 377 cases are tabulated (table 1).

Diagnostically, in my experience, the pain and anuria have been the most important symptoms. Cystoscopy, in conjunction with retrograde injection pyelograms, was the most important diagnostic procedure. Intravenous urograms were not satisfactory. The kidneys failing to secrete the dye gave no roentgenographic shadows. In nine of the twenty-two cases, or 40 per cent, there was no calculus shadow on the roentgenogram of sufficient density to make a diagnosis.

In the treatment of calculous anuria the first step was to relieve the obstruction. The various procedures for the relief of the obstruction were:

1. Cystoscopy and extraction of the calculus.
2. Insertion of a ureteral retention catheter past the obstruction with later extraction of the calculus.
3. Ureterotomy with removal of the calculus.
4. Pyelotomy with removal of the calculus.
5. Nephrostomy, single or double, with or without removal of the calculus.

In two cases, or 11 per cent, it was possible to use the cystoscope and extract the calculus. In one, a case in which anuria had existed for forty-eight hours without infection, there was an impacted calculus in the orifice of the only functioning ureter, from which it was possible to dislodge and remove the calculus on the first examination. The second case was one of reflex or toxic anuria in which the patient had been anuric for six days, for four of which he was under treatment for circulatory collapse, with endeavors made to stimulate the unobstructed kidney. At the first cystoscopy possible to be made, the obstructing calculus in the ureteral orifice was dislodged and removed, followed by rapid recovery of the patient. This procedure, when it can be performed, offers the shortest method of relief. One additional case presented an anuria of two stages. The first stage was an anuria of two days from a block of the only kidney, with relief on the passage of the calculus into the bladder, only to become lodged in the urethra, totally obstructing it. The calculus was removed from the urethra with a Howard spiral stone dislodger.

In three cases, or 14 per cent, it was possible to pass a ureteral catheter by an obstructing calculus in the ureter of a solitary kidney. Two of these calculi were in the lower ureter and one in the upper ureter. All were uninfected and the two in the lower ureter were primary calculi. The catheters were left in place to drain the kidney, which they did successfully. In the two lower ureteral calculi, on removal of the catheter after twenty-four hours had elapsed, the calculi were successfully passed and to date there has been no recurrence. In the case with calculus in the upper ureter the catheter dislodged the calculus back up the ureter, leaving the kidney unblocked. This case, one of cystine stone, showed a rapid increase in size of the calculus and a descent seventeen days later with recurrence of the anuria, necessitating a ureterotomy for relief. To date there has been no recurrence of calculus. In several other cases it was possible after considerable manipulation to pass a small catheter by the obstructing calculus, but no therapeutic value could be obtained by the use of the catheter because these cases were associated with infection and drainage was effected through the catheters with difficulty. Eisendrath reported good results in catheter drainage of some anuric patients, and it may be of benefit in the preparation of these cases for operation to lessen the risk.

Ureterotomy with removal of bilateral calculi was done in two cases, or 10 per cent. One presented bilateral calculi in the lower ureter with a four day anuria and infection. Drainage was attempted by cystoscopy and catheter without success. The calculi were removed by a midline, bilateral pelvic ureterotomy, followed by drainage. The operation was followed by paralytic ileus, septicemia and death. The second case presented a pyelolithotomy with decapsulation of one kidney for a calculus obstructing the pelvis and a ureterotomy with removal of a calculus from the lower ureter on the opposite side. This case was of long standing anuria with infection, and the operative procedure was followed by septicemia, exhaustion and

From the Squier Urological Clinic, Columbia-Presbyterian Medical Center.
Read before the Section on Urology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

death. Autopsy showed a perinephric abscess and multiple abscesses throughout the parenchyma of the untouched kidney, unrecognized clinically because of stupor and toxemia.

Experience with these two cases, in contrast to the three similar cases in which the calculus was ignored at first and a nephrostomy with renal decapsulation performed, all three followed by recovery, confirms the

TABLE 1.—*Calculous Anuria*

Condition	Number	Per Cent
1. Bilateral calculi	92	24.4
2. Unilateral calculi		
(*a*) Opposite kidney disease	45	11.9
(*b*) Condition of opposite kidney unknown	53	14
(*c*) Opposite kidney absent, removed or aplastic	128	33.9
(*d*) Reflex inhibition of opposite kidney	59	15.6

belief based on experience and previously expressed in my reported cases, as well as the belief of other writers, that, when anuria is severe or associated with infection, drainage is the safer procedure. Removal of the calculi would seem to be the first necessary step, but the risk of having unrecognized renal damage or infection that is masked by the toxemia is too great. Nephrostomy with drainage in this type of case is better surgery.

Pyelotomy or ureterotomy near the pelvis with removal of the calculus was done in four cases, or 18 per cent. In all these, the kidney had not been previously operated on and they were all classified as uninfected. In all, the renal area was exposed and the kidney freed and examined. The renal fossa was drained to care for the perirenal edema. Recovery was rapid in these four cases and to date there has been no recurrence. Technically the procedure was simple, except for the marked edema of the perirenal tissues obscuring the field, and they were all practically bloodless.

A combination of pyelotomy and nephrostomy was done in three cases, or 13 per cent. These were all recurrent calculi and in all there was a clinical evidence of infection. The cases presented multiple calculi in addition to the obstructing ones. The calculi were removed from the kidneys through the pyelotomy incisions, but the nephrostomies were done for better drainage, for longer drainage and for intrarenal lavage. Two of these patients had a recurrence of calculi with

TABLE 2.—*Urea Retention from the Blood*

6th day	Urea, 230 mg. per hundred cubic centimeters
6th day	Nephrostomy
8th day	Urea, 153 mg. per hundred cubic centimeters
10th day	Urea, 48 mg. per hundred cubic centimeters
15th day	Urea, 21 mg. per hundred cubic centimeters

anuria. In both cases, drainage by nephrostomy was again done. The infection in each persisted in spite of drainage, lavage and medication, accompanied by slow deterioration of renal tissue. Death finally resulted from exhaustion and infection. One patient has continued on drainage with a functioning kidney but with persistent renal infection. This is apparently made worse by intrarenal lavage and progresses satisfactorily without it.

Nephrostomy was done in eight cases, or 36 per cent. Of these, three were cases of calculi in kidneys not previously operated on. In these three cases, the calculus in the ureter was ignored at the time of nephrostomy, and in two the calculi were passed spontaneously while the nephrostomy was draining. The third necessitated a ureterotomy and removal of the calculus while the nephrostomy was draining. None of the patients were considered to be infected clinically. All have been well to date—two for six years and one for three years. Four patients had calculi in the kidneys not previously operated on, but in all evidence of severe infection was present. Of these, one recovered from a toxic suppression or a renoreflex suppression and has been alive seven years without recurrence. Two patients were seen in the terminal stages of obstruction and they failed to survive the nephrostomy. In the last of these four cases, nephrostomy was performed three times for anuria with infection and recurrent calculi. The last nephrostomy was made permanent and the patient survived three months. Autopsy showed that the kidney had developed a thick inflammatory exudate covering the entire pelvis and calices and obstructing all the collecting tubules. One of these eight patients had two attacks of anuria, both relieved by nephros-

TABLE 3.—*Rate of Increase and Decrease of Blood Urea*

	Urea, Mg. per 100 Cc.	Creatinine, Mg. per 100 Cc.	Carbon Dioxide Coefficient
3d day	78	5	....
3d day Nephrostomy			
5th day	95	..	....
7th day	116	12	31.5
9th day	103	..	....
10th day	94.5	9.5	40.9
11th day	85	8.4	35 *
11th day	....	..	48 †
14th day	77	..	....
16th day	64	..	44
20th day	38	..	47
33d day	25	..	50.4

* Before bicarbonate infusion.
† After bicarbonate infusion.

tomy. Under treatment he has been well and free from recurrence for eight years.

In cases of bilateral obstructions, the operation on both sides was done at one sitting. The last obstructed kidney was always operated on first. This was done on the supposition that this kidney would be the least damaged and, if any operative accident prevented the relief of the second kidney, temporary function at least would be restored.

Following relief from obstruction there were marked changes in the patient's symptoms. Before operation the patient usually showed a dry skin and lack of thirst; after operation there was profuse sweating and return of thirst. In the uninfected cases there was rapid secretion of urine and the elimination of the increased urea retention from the blood; for example, uninfected block with recovery (table 2).

In the infected cases secretion often did not start until twenty-four or forty-eight hours or more after the nephrostomy. It was assumed that it was necessary for the renal tissue to be relieved of the edema and infectious tissue exudate before its proper physiologic function could be resumed. In all these cases the blood urea increased for a variable time, usually several days, before beginning to fall. The fall was then at a regular rate; for example a case, infected, with three days anuria (table 3).

Urinary calculi were divided into primary and secondary varieties. The primary were those considered to have excessive excretion of normal urinary crystalloids, such as uric acid, urates and oxalic acid. Patients with this type of calculi all recovered. The secondary type of calculi was those accompanied by infection or recurrent calculi from colloids normally absent, but when present associated with urea splitting bacteria. These are mostly the phosphates and carbonates of ammonia and calcium. These are precipitated in alkaline urine. Cases under the secondary type presented serious difficulties. Experimentally, a number of factors have been shown to play a part in the formation and recurrence of this secondary type of calculi:

1. Disturbance of metabolism by vitamin A and vitamin D deficiency.
2. Infection by bacteria with the power of splitting urea, particularly staphylococcus and proteus.
3. Presence of obstruction and stasis of the urinary elimination.

The frequency with which these infections become bilateral has caused several observers to suggest that the transmission path is by way of the blood stream.

TABLE 4.—*Results of Treatment in Twenty-Two Cases*

1. Cystoscopy and extraction of the calculus:	
2 cases (1 infected, 1 uninfected)	2 recoveries
2. Passing ureteral catheter by the obstruction with retention of catheter:	
3 cases (2, calculi in lower ureter, both passed; 1, calculi in upper ureter, later ureterotomy)	3 recoveries
3. Ureterotomy with removal of calculus:	
2 bilateral cases, both infected:	
(1) bilateral in lower ureter: ureterotomy, bilateral	
(1) one in lower, one in upper ureter: ureterotomy, pyelotomy	2 deaths
4. Pyelotomy or ureterotomy near the pelvis:	
4 cases, uninfected	4 recoveries
5. Pyelotomy and nephrostomy:	
3 cases, infected	2 deaths
	1 recovery
6. Nephrostomy:	
8 cases, 3 uninfected	3 recoveries
4 infected	1 recovery
	2 deaths
with permanent drainage	1 recovery
1 recurrent, infected	1 recovery

In the recovery of these patients the underlying principles appear to be, first, the ability of the kidney to overcome the infection, and, second, the ability to restore or improve its physiologic function. Sufficient proof has been shown experimentally and clinically that a short block does not appreciably damage a kidney. Evidence has been offered that an obstruction with infection is accompanied by a rapid dissemination of infection and severe and often irreparable damage to the renal parenchyma. From such damage, recovery is best accomplished by free and prolonged drainage, and this apparently was best accomplished by nephrostomy.

In the early treatment of these cases the profuse forcing of fluids by subcutaneous administration and by intravenous dextrose solutions in various concentrations has been of great value clinically for the return of renal secretion. If secondary anemia was present with the infected cases, it is shown that the renal output will rise rapidly as the blood content is restored toward normal. This was done with whole blood transfusions. In some cases the restoration of renal secretion has followed only transfusion.

Renal lavage, in my experience, has not been followed by good results. It has prolonged the fever and symptoms in infected cases and has not proved of value in the prevention of recurrence. The use of bacteriophage offers a new field for the treatment of cases of infection. It works best in an alkaline medium, the usual reaction of these cases, and a fairly strong bacteriophage has been developed against the staphylococcus. The bacteriophage apparently is not yet powerful enough to be of help against Proteus.

The concentration of the acid tide by ketogenic diet and by acidulation with dilute hydrochloric acid and ammonium chloride has produced relief in a number of cases after operation, but only in those cases in which there was faithful cooperation in the treatment.

The treatments with the results in these cases are shown in table 4.

121 East Sixtieth Street.

ABSTRACT OF DISCUSSION

DR. HARRY R. TRATTNER, Cleveland: Of 157 patients with lithiasis of the urinary tract admitted to the Cleveland City Hospital, fourteen were found to be partially or completely anuric. Eight of the fourteen were moribund when admitted and died shortly afterward. It is obvious that partial or complete suppression of urine in the presence of lithiasis is an emergency problem. Until the results of a general physical examination and cystoscopic, roentgen and laboratory studies are coordinated and evaluated, the cause of the anuria cannot be determined. The very toxic or comatose patient is often tentatively diagnosed or suspected of having cerebral hemorrhage, poisoning by various drugs, pneumonia, acute yellow atrophy of the liver, acute pancreatitis, or empyema of the gallbladder. In partial anuria the diagnosis is sometimes masked and the patient is thought to have nephrosclerosis with hypertension and uremia from that source. The absence of fever is misleading as to the presence of infection, severe or otherwise. The patient may be icteric from a hemolytic type of infection with pain in the right upper quadrant of the abdomen, thus simulating disease of the biliary passages, or there may be an acute diffuse hepatitis secondary to the renal infection, as occurred in another of our patients. One should look for and expect pathologic changes in the chest in the form of empyema, purulent bronchitis, bronchopneumonia, pericarditis or cardiac hypertrophy, requiring the services of an internist. The urea and creatinine are not always elevated in consistency with each other. When neither is as high as expected or is slightly elevated above the normal, the patient's poor condition is usually attributable to infection of the urinary tract with or without septicemia. I do not agree with Dr. Cahill in attaching importance to the retrograde pyelogram in anuric patients. I think it is a procedure fraught with danger because of the irritating effects of the hypertonic solution, its possible retention above the obstruction, and the possibility of pyelovenous backflow along with infected contents of the renal pelvis. The increase in intrapelvic pressure causes a marked disturbance in renal circulation, slowing the venous outflow with increase in kidney volume. Cystoscopy and ureteral catheterization, a plain x-ray plate of the urinary tract, and fluoroscopy to determine the level and action of the diaphragm, together with general observations and examinations previously spoken of, eliminate the necessity for retrograde pyelograms in most instances. As for myself, I employ the hydrophoragraph connected to the ureteral catheter for the determination of partial or complete obstruction and its location as well as the detection of ureteritis, if present. This method has been described in the literature and accurately depicts the physiopathologic state of the upper urinary tract. Decapsulation of the kidney would be of great benefit if the kidney should be under tension, for the renal capsule is reflected from the vessels at the hilus and mechanically retards the venous flow from the kidney when put on a stretch. Decapsulation may also be of value in permitting cortical abscesses of the kidney to drain. When the kidney is buried in dense adhesions it is much safer to mobilize it intra-

capsularly, particularly on its anterior surface, than to attempt a dissection of the adhesions with the risk of opening the peritoneal cavity. Nephrectomy is contraindicated in anuric patients because renal tissue, no matter how small in amount, must be conserved, even though a considerable portion of it is diseased. Low ureterotomy for the removal of the calculus is definitely contraindicated, but high ureterotomy for drainage and removal of the calculus if in that vicinity is permissible. Nephrostomy is frequently a most important procedure. Pyelotomy is a most valuable procedure, permitting the extraction of renal pelvic stones and drainage without destruction of renal tissue. Venesection-transfusion should be performed as quickly as possible if the hemoglobin is not greatly reduced; or, if such is the case, transfusion alone without venesection should be done. In 1924 Bowers and Trattner reported recovery from anuria by repeated venesection-transfusions, showing that the blood was temporarily relieved of nitrogen retention, tiding the patient over a critical period until the kidneys could again resume their function. The same procedure has been successful in two cases of anuria from mercuric chloride poisoning coming under my observation. It was pleasing to note that Dr. Cahill found excretion of urine occurring following transfusion. The success attained by Dr. Cahill in the management of these desperate cases is a tribute to his personal skill and to the modern advances in chemistry, medicine and surgery.

DR. ERNEST M. WATSON, Buffalo: Dr. Cahill's experience in handling twenty-two cases of calculous anuria shows several important basic principles that are timely. Despite the fact that nine, or 40 per cent, of his twenty-two cases failed to show any diagnostic shadow on the plain x-ray film, I still believe that the taking of a plain plate should be the first step in handling these patients. Secondly, every effort should be made to pass a ureteral catheter up the ureter—or even part way up. On several occasions I have been able to pass a small catheter 1 or 2 cm. by the obstructing calculus in the lower ureter of a single kidney and establish drainage, without passing it up the entire ureter. With drainage even imperfectly established, we can often change the situation from an immediate emergency operative intervention to one of election at a more opportune time. Even in cases of bilateral pelvic calculi the passage of a catheter up to the pelvis and by the stone may establish adequate drainage and better prepare the patient for later operation. When readily possible, I believe that pyelotomy drainage is the step of choice in uninfected cases or those of only mild infection. Large renal calculi may sometimes best be handled through nephrotomy wounds. In most instances, too, a thorough lavage of the interior of the kidney at operation with from 1 to 2 quarts of salt solution helps to control bleeding and may wash out a few tiny calcareous particles that might later serve as nuclei for further stone formation. In bilateral involvement I still hesitate to subscribe to the thought of bilateral operation (other than drainage) at a single sitting. In these cases, too, I firmly agree with Dr. Cahill that dextrose intravenously and fluids by hypodermoclysis both before and after operation are most helpful. In bilateral stone cases every effort should be made to conserve every possible usable portion of renal tissue. In them as an end result a mildly infected kidney carefully watched is far better than no kidney at all.

DR. GEORGE F. CAHILL, New York: There are two important points to be stressed: First, there is a difference in prognosis between primary and secondary stones. If primary, all patients recover; if secondary, frequent recurrence with infection is to be expected and these patients die more frequently from dissemination of the infection than from anuria. Second, in the treatment of these cases, the surgical relief of the anuria and the drainage of the infection produced the best results.

One Ounce of Raw Cabbage or Onion.—It is estimated that the daily amount of vitamin C which a man must have to protect him from scurvy is about the amount contained in one ounce of orange or grapefruit (raw or canned) or lemon, or canned tomato, or raw cabbage or onion, or in about one pound of cooked cabbage or potato, or in a pint of milk; but instead of reliance on any one of these items the equivalent of several of them should be included in the daily dietary to ensure optimal nutritional well being.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

THE PRESENT CONCEPTION OF RENAL LITHIASIS

VIRGIL S. COUNSELLER, M.D.
AND
JAMES T. PRIESTLEY, M.D.
ROCHESTER, MINN.

The cause of renal lithiasis is nearly as obscure today as it was twenty years ago, although progress in management of the disease cannot be denied. As Joly [1] has briefly stated it, "Our methods of investigation have been revolutionized by the introduction of radiography and cystoscopy. An operation for stone in the upper urinary tract is no longer exploratory. One knows the position, size, and shape of the calculus, the condition of the kidney, the complications (if any) before the patient comes to operation. The result is that operations for stone in the kidney and ureter are now done to an exact scientific basis. The procedure is well regulated, and the minimum amount of damage inflicted on the patient. Also, our conceptions of stone formation have been fundamentally changed by recent advances in physiological chemistry. It is quite possible that they, in turn, may suggest fresh prophylactic and preventive treatment." The results of research on the cause of formation of stones and the results of treatment, as published by various urologists, make necessary from time to time a general survey of the entire field. With this idea in mind we propose briefly to review recent as well as some earlier work on the formation of stones, the general surgical principles involved in present-day treatment and, finally, postoperative and prophylactic treatment of this condition.

CAUSE OF FORMATION OF STONES

Many theories have been advanced as to the etiology of renal stones. Unfortunately, no single theory so far propounded appears to satisfy the requirements. The theory of infection, sponsored chiefly by Rosenow [2] and his co-workers, has many adherents. Rosenow was able to produce calculi in the kidneys of animals by injection of a specific organism obtained from cultures of teeth, tonsils and urine of patients suffering from recurring renal calculi. The organisms (streptococci) were implanted into devitalized teeth of dogs. Stones were produced in the dogs' kidneys in approximately 60 per cent of the experiments. This work is now being repeated by Rosenow, with identical results.

Hager and Magath [3] isolated from the urine of patients afflicted with alkaline encrusted cystitis an organism closely related to the Salmonella Proteus ammoniae. In a study of these bacilli it was seen that their chief function was to split urea into ammonia and carbonic acid. Injection of these organisms into the bladder of dogs failed to produce any disturbance in the bladder until chemical cystitis had been produced by an irritating substance; chronic encrusted cystitis then resulted, with an alkaline urine. These bacteria are now regularly isolated from the urine of patients afflicted with alkaline encrusted cystitis, and they are regarded as secondary invaders favoring the precipita-

From the Division of Surgery, the Mayo Clinic.
Read before the Section on Urology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

1. Joly, J. Swift: Stone and Calculous Disease of the Urinary Organs, St. Louis, C. V. Mosby Company, 1929.
2. Rosenow, E. C.: The Production of Urinary Calculi by the Devitalization and Infection of Teeth in Dogs with Streptococci from Cases of Nephrolithiasis: Summary of Results, Illinois M. J. **49**: 28-33 (Jan.) 1926.
3. Hager, B. H., and Magath, T. B.: The Etiology of Encrusted Cystititis with Alkaline Urine, J. A. M. A. **85**: 1352-1355 (Oct. 31) 1925.

tion of urinary salts. C. H. Mayo [4] often has directed our attention to the question of stagnation and infection, and he regards the kidney as an organ of filtration which is constantly eliminating bacteria from the circulation. This hypothesis of infection he considers the only tenable one, and he contends that the development of stones requires the presence of two types of bacteria; one of these produces hematogenous infection, whereas the other may come from a local focus. Bacteria of the stone-forming type must come in contact with the mucoid exudate when the latter is present in the kidney as a result of the first infection. Rovsing [5] expressed the opinion that urea-splitting organisms account for 71 per cent of the recurrences of stone, and that nephrectomy should seriously be considered in renal lithiasis when a urea-splitting organism is found unilaterally. This seems to us, in view of present methods of postoperative care, a radical procedure and not justified.

There is no doubt that stasis and infection are contributory causes in many cases of nephrolithiasis, but the exact influence these factors exert is not clear. The frequency of formation of stone associated with obstruction of the urethra and of the vesical neck, with diverticula of the bladder, and with incomplete obstruction at the ureteropelvic juncture, certainly is presumptive evidence of the etiologic influence of faulty drainage in cases of renal lithiasis. Infection is associated with faulty drainage in most instances. Livermore [6] and others hold that it is only of academic interest how the infection gets into the urinary tract, whether by way of the blood stream or by stasis from ureteral stricture, ptosis of the kidney, tumors of the kidney, faulty metabolism or dietary indiscretion; any of these may cause sufficient irritation to the renal pelvis to allow infection to gain a foothold and to furnish the nucleus of blood or pus on which crystals may deposit. Hunner [7] and Mathé [8] regard ureteral stricture as an important factor in the cause of formation of stone. That this theory is difficult to prove has been pointed out by Braasch,[9] in that it is quite as difficult to say whether stricture found at operation is primary or secondary as it is to determine its presence clinically. In addition, renal or ureteral stone is so often found without any evidence of stricture that it can hardly be a common etiologic factor.

Keyser [10] is of the opinion that there is sufficient clinical evidence to show that stasis is not the primary factor. Stirling,[11] in discussing renal stones, noted their presence in only 15 per cent of cases of prostatic obstruction, and he found that vesical diverticula, ureteral strictures, hydronephrosis, ulcerations of the bladder, and infections of the urinary tract without stasis, in general are more often found without calculus than with it. He expressed the opinion, however, that when the stone-forming mechanism is present, when crystals are being deposited by infection or by colloidal disturbances, it can easily be understood how stagnation enhances their retention and growth.

DIETETIC FACTORS CAUSING STONE

Careful study of the experimental work of McCarrison [12] on the formation of renal stones in rats and cattle in India, and his clinical observations on this disease among the various peoples of India, leaves no doubt that there is some evidence of a relationship between a deficiency of vitamin A and the formation of urinary calculi. Furthermore McCarrison noted that, if vitamin C was removed from the diet along with vitamin A, a greater influence on stone formation was produced, and if earthy phosphates were added to this diet deficient in vitamins, the rate and degree of calculus formation was increased. The mechanism involved is not settled, but a fairly clear explanation is the serious injury that occurs to the urinary epithelium in the presence of a deficiency of vitamin A. It is quite probable that the desquamated, keratinized epithelium from the urinary tract may form the nidus around which deposition of stony material occurs. The stones produced experimentally nearly always are of the calcium phosphate variety. The interesting point in this connection is that they are nearly always associated with infection. Joly regards the formation of stone following a deficiency in vitamin A as resulting from some action on the urinary colloids that reduces their power of holding stone-forming salts in solution.

THE RÔLE OF PROTECTIVE COLLOIDS

Ebstein [13] was the first to draw attention to the importance of the colloids in stone formation, and he was of the opinion that colloids were the primary factor and crystalloids the secondary factor in their production. Rainey and Ord,[13] however, previously had pointed out that crystals formed in solutions containing colloids differed from those derived from pure watery solutions. From the work of Ord and Shattock,[14] who laid down the physical principle that colloidal matter in vitro modified crystalline morphology, and from the microscopic studies of oxalate and urate calculi by Ord,[15] who concluded that they were made up of a variety of fused crystals, it appears that the power of the urine to hold the water-insoluble salts of stone in solution is due to protective colloids. These physical principles have been confirmed by Lichtwitz [16] and Schade.[17] Joly expressed the belief that, in general, both crystalloids and colloids are essential in the production of stone and that it is incorrect to assign a principal part to either of them; too, that this is the generally accepted opinion.

Keyser has caused calculi to be formed in the urinary tract by producing excessive excretion of urinary crystalloids in such an amount that the protective colloids could no longer take care of the solution of the crystals.

These observations indicate that the prevention of calculi is dependent on protective colloids in the urine.

4. Mayo, C. H.: Renal and Ureteral Stone, Internat. J. Med. & Surg. **42**: 613-615 (Dec.) 1929.
5. Rovsing, C. M.: On Infection as a Cause of Recurrence Following Operations for Kidney Stone, Acta. chir. Scandinav. **57**: 387-395, 1924.
6. Livermore, G. R.: Nephrolithiasis, South. M. J. **18**: 603-607 (Aug.) 1925.
7. Hunner, G. L.: Calculus of the Upper Urinary Tract Treated by New Methods: End Results, J. Urol. **20**: 61-81 (July) 1928.
8. Mathé C. P.: The Present-Day Management of Stone in the Kidney, J. A. M. A. **96**: 657-664 (Feb. 28) 1931.
9. Braasch, W. F.: Clinical Data in Cases of Renal Lithiasis, Illinois M. J. **47**: 284-287 (April) 1925.
10. Keyser, L. D.: Urinary Lithiasis: Its Cause and Prevention: An Evaluation of Contributions to Our Knowledge During the Past Decade, South. M. J. **25**: 1031-1040 (Oct.) 1932.
11. Stirling, W. C.: Kidney Stone: Review of Thirty-Five Cases, J. Urol. **18**: 259-268 (Sept.) 1927.
12. McCarrison, Robert: The Causation of Stone in India, Brit. M. J. **1**: 1009-1015 (June 13) 1931.
13. Quoted from Joly.[1]
14. Ord, W. M., and Shattock, S. G.: On the Microsopic Structure of Urinary Calculi of Oxalate of Lime, Tr. Path. Soc. London **46**: 91-132, 1895.
15. Ord, W. M.: Some Experiments Relating to the Forms Assumed by Uric Acid, London, St. Thomas Hosp. Rep. **1**: 335-348, 1870; An Account of Some Experiments Relating to the Influence Exercised by Colloid upon the Forms of Inorganic Matter, ibid. **2**: 1-22, 1871; On "Molecular Coalescence" and on the Influence Exercised by Colloids upon Forms of Inorganic Matter, Quart. J. Micr. Sc. **12**: 219-239, 1872.
16. Lichtwitz, N., and Rosenbach, Otto: Untersuchungen über Kolloide im Urin, Ztschr. f. physiol. Chem. **61**: 112-118, 1909.
17. Schade, H.: Beiträge zur Konkrementbildung, München. med. Wchnschr. **56**: 77-80 (Jan. 12) 1909.

When crystalloids are abnormally excessive, colloids may be unable to retain them in solution, thereby resulting in formation of calculi. Likewise, if the protective power of the colloids is interfered with, as Keyser stated, by the production of abnormal colloids that may arise from metabolic sources or from the product of bacterial inflammation, then calculus formation may result.

HYPERPARATHYROIDISM

Studies on the parathyroid bodies recently have served to increase the probability that renal lithiasis is in some fashion linked to disturbances in metabolism. Albright, Aub and Bauer [18] relate that hyperparathyroidism is almost unique in giving the combination of a high level of serum calcium and of a low level of serum phosphorus, which is accounted for by an increased production of the hormone of the parathyroid bodies, which in turn produces a disturbance in the metabolism of calcium and phosphorus. The manifestation of this metabolic disturbance also is revealed by an increase of both calcium and phosphorus in the urine. Polyuria and polydipsia are noted in nearly all cases and are attributed to the increased excretion of calcium and phosphorus. A similar observation was made by McCarrison in his feeding experiments on rats. This increase of calcium and phosphorus in the urine may lead to the formation of urinary calculi. Albright and Baird [19] found twenty-three instances of this in a series of eighty-three cases. Moreover, the calcium phosphate was deposited in the parenchyma of the kidney, so that the renal pyramids were sometimes outlined by a flat roentgenogram of the abdomen. Of seventeen cases of hyperparathyroidism reported by Albright, Aub and Bauer, in ten urinary calculi were present, whereas in seven the only symptoms were those pertaining to calculi and in five of these seven there were no evidences of bone disease. This observation seems to us important, if one is seriously to consider disturbance in metabolism as an etiologic factor in the production of renal stones. Eight of these seventeen cases of hyperparathyroidism were discovered as a result of doing routine calcium and phosphorus determinations on all patients with urinary calculi. Albright and his associates were inclined to deduce from the foregoing evidence in their group of cases that hyperparathyroidism will turn out to be a fairly common cause of urinary stone.

Dysfunction of the parathyroid bodies is now definitely associated with a rather high incidence of renal lithiasis, which is fundamentally the result of disturbed calcium and phosphorus metabolism. It is not unlikely that urinary stones associated with long disability incident to fractures, arthritis and other conditions may have a similar etiology.

GENERAL SURGICAL CONSIDERATIONS

The indications and the type of operation for the removal of a single stone that is too large to pass spontaneously have been fairly well standardized. In the past, nephrolithotomy was the operation of choice for removal of a renal stone, but except for a stone or stones situated just beneath the renal capsule or impacted high in one of the calices, pelviolithotomy is now the preferable procedure. This especially is true for the single stone that is situated in the renal pelvis. By careful manipulation, many single or multiple stones situated in the calices can also be removed through incision of the renal pelvis. Removing stones through the renal pelvis does not destroy important structures; large blood vessels are not divided and a satisfactory anatomic closure can be obtained. Urinary fistulas very rarely follow this procedure. Pelvionephrolithotomy is used to distinct advantage when a stone is impacted in a calix, or if there are branches extending into one or more calices. By introducing the finger through the pelvic incision, the stone or stones can be pushed toward the cortex, which not infrequently is scarred or somewhat thin over this region and, by making a small incision through the cortex or by using a pointed forceps as advocated by Judd and Scholl,[20] the stones can quite easily be extracted. When an upper or lower calix has been greatly dilated by the presence of large or multiple stones, and accurate drainage cannot be reestablished, Herbst [21] advised resection of that portion of the kidney. Occasionally the renal pelvis is small or mostly intrarenal. In such cases more of the pelvis can be exposed by gentle retraction of the parenchyma with a flat ribbon retractor, thereby greatly facilitating removal of stones from such pelves.

Which surgical procedure is best in the management of multiple stones cannot be dogmatically stated, since the choice of procedure must be governed largely by clinical judgment in a given case. In the past decade there has been a decided tendency toward conservative surgical measures for renal stones. It is a simple procedure to remove a kidney for stone, but it requires much experience and several technical aids to remove all stones or stony fragments and to preserve the kidney. In the presence of extensive infection with great destruction of renal tissue, nephrectomy is the wisest procedure. This particularly is true if the opposite kidney is normal. Nephrectomy for single or multiple stones without infection should be condemned.

Conservative operations depend on the type, size and situation of the stones, the presence or absence of infection, status of the opposite kidney, whether or not the stones are bilateral or unilateral, on renal function, and on the general condition of the patient. An elderly patient with renal stones, for whom operation would be a great risk and who is not having many symptoms, should not be subjected to operative treatment. Cardiac lesions of the coronary type, even in middle life, must be regarded as an important contraindication to surgical removal of renal stones of the silent type. The risk of the cardiac lesion may be greater than that attending removal of stones.

Considerable controversy still exists regarding management of the stag-horn or coral-form type of stone. The reason is that they often are symptomless and are discovered only during routine examination; their removal usually has been difficult and attended with considerable destruction of renal parenchyma. Mathé [22] advised that, if a patient presenting coral-shaped stone of one or both kidneys gave a history of passing fragments, operative intervention should be instituted at once. In proof of his statement he cited five cases in which fragments broke off and produced obstruction in

18. Albright, Fuller; Aub, J. C., and Bauer, Walter: Hyperparathyroidism: A Common and Polymorphic Condition as Illustrated by Seventeen Proved Cases from One Clinic, J. A. M. A. **102:** 1276-1287 (April 21) 1934.

19. Albright, Fuller; Baird, P. C.; Cope, Oliver, and Bloomberg, Esther: Studies on the Physiology of the Parathyroid Glands: IV. Renal Complications of Hyperparathyroidism, Am. J. M. Sc. **187:** 49-65 (Jan.) 1934.

20. Judd, E. S., and Scholl, A. J.: Renal Calculus, Texas State J. Med. **20:** 434-439 (Dec.) 1924.

21. Herbst, R. H.: Recurrent Renal Calculus: Its Cause and Prevention, Tr. Chicago Urol. Soc. **1:** 73-80, 1931.

22. Mathé, C. P.: The Management of Stone in the Solitary Kidney and Ureter, Surg., Gynec. & Obst. **52:** 79-86 (Jan.) 1931.

various portions of the ureter, necessitating emergency procedures. The late Dr. Geraghty [23] advised against removal of such stones on account of the extensive injury incident to their removal and the frequency of recurrences; on the other hand, Livermore, and Kelly and Burnham,[24] advocated their immediate removal, correction of any stasis, elimination of infection, and frequent postoperative examination.

In the past few years we have been able to remove successfully stag-horn stones from the kidney in most cases; in several of these cases the stones were bilateral, serious injury to the kidney, its pelvis, or ureter did not take place, and all fragments were removed. The method employed in removal consisted of retraction of the parenchyma to the bifurcation of the calices, as suggested by von Lichtenberg, thus giving direct access to the calices through a V incision in the renal pelvis. By nephrotomy over each calix, the portion of stone in that calix was removed, the forefinger of each hand being used, one in the pelvis and one in the calix. Bleeding from the parenchymal opening was controlled by suture or by Pezzar catheters pulled snugly up into the calix.

The surgical treatment of bilateral renal lithiasis is a problem that requires mature judgment and care. There are many who believe that, if the stones are of the aseptic or primary type, surgical removal is contraindicated, provided the stones are small, are not fixed in a calix, do not cause symptoms, and do not interfere with urinary drainage, and that all other aseptic stones which from their situation and size are likely to injure the renal parenchyma should be removed surgically. If infection is superimposed, then the stones should be removed as early as possible before extensive renal injury takes place. After the stones are removed completely, the problem is one of eliminating infection and of restoring renal function. A kidney that is obstructed and infected may appear from clinical examination to have little if any functional capacity, but at operation it may be found to possess much sound renal tissue that may be valuable to the patient, especially if the opposite kidney also is injured.

Cabot [25] has pointed out the value of nephrostomy for infected and obstructed kidneys in providing a method of immediate drainage, which is so essential in these cases and which promotes elimination of infection. Nephrostomy for drainage is superior to pyelostomy, by virtue of the fact that urinary fistulas rarely occur and the wound closes rapidly following removal of the tube.

The frequent reports in the literature of the occurrence of calculi in solitary kidneys serve to emphasize the importance of this urologic problem. Beer [26] in 1916 advocated early surgical removal of stone from the ureter in the presence of solitary kidney. Keyes [27] in 1930 reported five cases in which the surgical removal of such stones was successfully accomplished. The severity of the disease is shown by the report of fifty-two cases by Walters and Wright [28] wherein stones were removed from the remaining kidney with a mortality rate of 14 per cent. The necessity for early removal of the stones before renal injury or infection has set in can hardly be overestimated. One of us recently removed a large triangular stone from the pelvis of a solitary kidney; this stone had completely blocked the ureteropelvic juncture about twenty-four hours previously. Following the removal of the stone by pelviolithotomy, the kidney was temporarily drained by nephrostomy for a period of ten days, when the tube was removed. Renal function returned rapidly and infection gradually subsided.

RECURRENCE AND PROPHYLACTIC CARE

The mere surgical removal of stones from the kidney no longer constitutes adequate treatment for renal calculi, as the postoperative care and management forms one of the more important phases of the treatment. Particularly is this true if infection is present in the urinary tract or a definite tendency toward recurrent calculi has been demonstrated; and if renal function is materially interfered with, subsequent attention to these factors is of particular importance. The incidence of recurrence of renal stones has been variously estimated. Braasch and Foulds [29] in 1924, reporting 504 cases, found recurrent calculi in approximately 10 per cent of them. Others have reported reformation of stone in from 30 to 40 per cent. Undoubtedly, small remnants of calculi not removed at the operation may account for certain cases of so-called recurrence. Despite this fact, however, a certain group of patients presents a definite tendency toward reformation of calculi. These individuals are similar in many respects to those patients who have recurrent ulcers following operation for peptic ulcer. In both types of cases, although the exact etiologic factors responsible for the disease remain undetermined, sufficient is known concerning apparently contributing causes to render preventive measures worth while. In brief, efforts directed toward prevention may be applied, with consideration of five main points:

1. *Complete Removal of Stones.*—It appears obvious that all calculi and stony fragments should be completely removed at the time of operation if recurrence is to be prevented. This may be accomplished only by the routine use of fluoroscopy and roentgenographic examination at the time of operation. With these aids, in association with careful surgical technic in order to avoid any undue trauma or bleeding, all of the stony fragments may be removed in practically every case. In rare instances it may be advisable, if a few minute fragments remain which cannot be removed without causing considerable trauma to the kidney, to forego total removal of all remnants in order not to jeopardize renal function.

2. *Complete Relief of Renal Obstruction.*—Although the exact part played by obstruction of the kidney in the formation of stones is not fully understood, every effort should nevertheless be made to provide free drainage of urine from the upper portion of the urinary tract following removal of stones. Not infrequently, because of obstructing factors such as anomalous vessels, bands of fibrous tissue, acute angulation of the ureter or other causes, obstruction may be discovered at the ureteropelvic juncture. This should be corrected, if possible, at the time of operation. The almost certain development or persistence of infection secondary to obstruction is well known, and it accentuates the

23. Geraghty, J. T., and Frontz, W. A.: Idiopathic Nephralgia, South. M. J. **16**: 462-466 (June) 1923.
24. Kelly, H. A., and Burnham, C. F.: Diseases of the Kidneys, Ureters and Bladder, New York, D. Appleton & Co., 1914.
25. Cabot, Hugh: Nephrostomy in Theory and Practice, South. Surg. **2**: 129-135 (June) 1933.
26. Beer, Edwin: Diagnosis and Treatment of Ureteral Calculi, New York State J. Med. **16**: 501-503 (Oct.) 1916.
27. Keyes, E. L.: Operation on the Single Kidney, Especially for Stone, J. A. M. A. **94**: 152-156 (Jan. 18) 1930.
28. Walters, Waltman, and Wright, William: Operations on Solitary Kidneys and Ureters: Report of Fifty-Two Cases, Surg., Gynec. & Obst. **51**: 836-839 (Dec.) 1930.
29. Braasch, W. F., and Foulds, G. S.: Postoperative Results of Nephrolithiasis, J. Urol. **11**: 525-537 (June) 1924.

importance of free drainage. In very exceptional cases, retrograde ureteral dilation may be indicated; however, it is exceptional in our experience to find renal calculi associated with true stricture of the ureter, and retrograde dilation seldom seems indicated.

3. *Elimination of Infection.*—At present, complete elimination of infection is one of the most important requirements in preventing subsequent formation of calculi. Different aids may be utilized in removing infection from the urinary tract. If the kidney is found to be rather extensively injured and to be the seat of marked infection at the time of operation, it frequently is advisable to insert a nephrostomy tube, preferably through the lower calix, in order to aid rehabilitation of the kidney. This not only provides excellent drainage but permits of direct pelvic lavage as often as desired. Gratifying results frequently are noted in the restoration of renal function and in the eradication of infection by the use of nephrostomy. Occasionally, if the kidney has not been drained by nephrostomy, pelvic lavage, by means of the ureteral catheter, with silver nitrate, phosphoric acid or other solutions, may be helpful in sterilizing the upper portion of the urinary tract.

Before any treatment can be intelligently planned against infection of the urinary tract, accurate information should be obtained regarding the exact type of offending bacteria. This necessitates cultures from the pelvis of the kidney and also from any stones that are removed. Strangely enough, the organism found in the stone may be different from that discovered in the pelvis of the kidney. The elimination of coccus forms and urea-splitting organisms from the urinary tract is essential if recurrent calculi are to be avoided.

Considerable has been written regarding various medicinal measures and the dietary treatment of infection in the urinary tract. It has been our experience that the best results are obtained by acidification of the urine with ammonium chloride or ammonium nitrate, given in association with methenamine if the offending organism belongs to the bacillary group. Methenamine is most effective if a p_H of the urine of at least 5.4 is obtained. If cultures reveal cocci, the nonspecific use of neoarsphenamine frequently is efficacious. When measures of this type fail to produce the desired results, the production of ketosis by the use of the ketogenic diet often will be effective.[30] A possible relationship between foci of infection and renal calculi makes [31] desirable removal of all sources of chronic infection.

4. *Correction of Metabolic Disorders.* — Various metabolic disorders may fundamentally be responsible for the formation of calculi. A routine chemical analysis of the calculus removed may aid in the detection of these disorders. In addition, microscopic examination of the urine may reveal cystinuria or uric acid crystals.

The association of hyperparathyroidism with renal calculi has been mentioned previously, and although this condition is relatively uncommon, estimations of the amounts of calcium and phosphorus in the blood and roentgenographic study of the bones may be advisable to exclude the possibility of hyperfunction of the parathyroid bodies.

30. Clark, A. L.: Bacilluria Under Ketogenic Treatment: A Study of Fifty Cases, Proc. Staff Meet., Mayo Clin. **7**: 257-260 (May 4) 1932. Helmholz, H. F.: The Ketogenic Diet in the Treatment of Urinary Infections of Childhood, J. A. M. A. **99**: 1305-1309 (Oct. 15) 1932.

31. Rosenow, E. C., and Meisser, J. G.: Nephritis and Urinary Calculi After Production of Chronic Foci of Infection: Preliminary Report, J. A. M. A. **78**: 266-267 (Jan. 28) 1922.

5. *Periodic Examinations.* — Periodic examinations of the urinary tract are desirable following removal of stones from the kidney. In many cases this may seem unnecessary and may be discontinued after several such examinations. On the other hand, if the patient presents a tendency toward persistent or recurrent infection in the urinary tract, or if he has impaired renal function or faulty drainage from the kidneys, periodic examinations are desirable for a number of years. This enables one to detect in its early stages any change in the condition of the patient before injury becomes too extensive to remedy. Stones may be recognized when they are still small, and infection may be combated before function is impaired further.

ABSTRACT OF DISCUSSION

DR. JEROME M. LYNCH, New York: I feel honored at being invited to discuss a topic before this assembly of specialists. At first glance there seems to be no contact between urology and diseases of the colon, rectum and anus, and yet you and I are deeply interested in the derivatives of the cloaca. Our fields are chiefly concerned with excretion. In casting about for etiologic factors in urinary lithiasis, certain indicators may point a way of investigation. Focal infection has been stressed for twenty years, and though the evidence is not convincing to me, it is good practice to check possible foci and suppress or eliminate those found to harbor infection. More important is the recent work defining the influence of certain parathyroid disturbances in producing stone in the urinary tract. This, I am sure, has furnished the necessary stimulus to the urologist to keep in mind the extra-urinary possibilities in the etiology of stone. I have been interested in the gastro-intestinal symptoms displayed in many stone cases. The mimicry of appendicitis by right ureteral stone is a commonplace to urologists. Similarly, attacks resembling gallstone colic or subacute obstruction occur with obstructed or infected kidney stone cases. Duodenal and gastric ulcer may be simulated by kidney stone in the absence of infection. Indeed, the periodicity associated with chronic peptic ulcer may be simulated in a striking manner. Hematemesis has occurred and no lesion except a kidney stone found. The syndrome called spastic colon can occur, to disappear following removal of the stones. It is apparent that the kidneys deserve the close attention of gastroenterologists and other internists in cooperation with urologists in the solution of resistant cases of dyspepsia.

DR. RICHARD CHUTE, Boston: I congratulate Drs. Counseller and Priestley on their summary of the present-day conception of renal lithiasis. They mention the frequent occurrence of calcium phosphate stones in hyperparathyroidism. I have seen a number of cases of hyperparathyroidism and learned something about this comparatively new condition from colleagues at the Massachusetts General Hospital who have done pioneer work in calcium metabolism. Hyperparathyroidism is due to an excess of the internal secretion of the parathyroid glands, which excess comes from either a benign adenoma or hyperplasia of one or more of the four parathyroids and results in raising the blood calcium, lowering the blood phosphorus and causing a greatly increased amount of both calcium and phosphorus to be constantly excreted by the urine. The very frequent occurrence of calcium phosphate lithiasis, ranging from large calculi down to minute multiple stonelets or calcifications throughout the tubules of the kidney cortex, is consequent to the large amount of calcium and phosphorus concentrated in the urine—in one case seven times the normal amount of urinary calcium. Since this stone formation depends on a general metabolic disturbance, these calcium phosphate stones tend to be bilateral and multiple and to recur until the underlying metabolic disturbance has been remedied. One patient had recurrent bilateral calcium phosphate calculi over a period of ten years until the cause was discovered and corrected. Cases of hyperparathyroidism are not rare. The Massachusetts General Hospital has accumulated a series of nineteen proved cases, of which fifteen were urinary lithiasis, which was bilateral and multiple in more than half. In the last fifteen months about 10 per cent of all stone cases that have

come to the Massachusetts General Hospital have been found to present an underlying hyperparathyroidism. The diagnosis is easily made and depends entirely on the finding of a high fasting serum calcium (the normal is 10 mg. per hundred cubic centimeters; the average in the nineteen cases was 14 mg.), and a low serum phosphorus (the normal is 4 mg. per hundred cubic centimeters; the average in the nineteen cases was 2.6 mg.). In addition to the usual urologic treatment for calculi, the only adequate treatment to date for hyperparathyroidism itself is surgical removal, either complete or subtotal, of the adenomatous or hyperplastic gland tissue, which has been well described by Churchill and Cope. Special diets, vitamins and radiation therapy directed to the neck has been tried without success. Surgical resection results in a rapid correction of the calcium phosphorus metabolism back to normal in both blood and urine. In eight cases, each of which has been followed for at least six months (and one case for two and one-half years) since the operation, the calcium and phosphorus metabolism has remained normal.

DR. VIRGIL S. COUNSELLER, Rochester, Minn.: The importance of what Dr. Chute has just said with regard to hyperparathyroidism should be stressed. It seems that this condition is definitely established as one of the etiologic factors in renal lithiasis, and it may be a more important factor than it is now regarded to be. The work of Albright, Aub and Bauer at the Massachusetts General Hospital in this connection certainly must be considered epoch making in its character. I want to reemphasize elimination of infection from the kidneys when conservative operation has been done. A word should be said regarding the value of nephrostomy. Dr. Cabot has pointed out how rapidly an infection can be eliminated from the kidney by temporarily retaining the conditions produced by nephrostomy. This I have observed many times. Too, when one traumatizes a kidney considerably in the removal of stones, particularly branched stones, nephrostomy is certainly a very protective mechanism, and this is also more true when one is dealing with a solitary kidney.

MANAGEMENT OF URETERAL STONE

OPERATION VERSUS EXPECTANCY AND MANIPULATION

FREDERIC E. B. FOLEY, M.D.
ST. PAUL

In recent years, ingenious devices and methods have been perfected for the passage or removal of ureteral stones without resort to operation. Properly employed, they have proved of great value and have reflected much credit on urology as a specialty. Among urologists, management of the condition according to this so-called conservative plan has become very popular and quite generally is regarded as the method of choice. There is much evidence that this attitude has carried too far and that the just purpose of such management is becoming subordinate to mere zeal for its use.

Conservatism in surgery deserving the name must have as its object welfare of the patient, and this must not be confused with the surgeon's zeal or prejudice for a particular method. The patient's welfare is a many sided objective in which mortality, morbidity, suffering, duration of disability and economic factors all are concerned.

Management of ureteral stone by expectancy and manipulation is enthusiastically described in published papers, in discussions at meetings and in the casual comment of colleagues. Very often pride is displayed in having effected the passage or removal of a stone without operation, but frequently the undesirable features of such methods are overlooked, or at least their morbidity, mortality and hardships are considerably underestimated. Only stones of very small size, ones no larger than a wheat kernel, give any promise of prompt passage or easy removal. Occasionally with these, and very frequently with stones of only slightly larger size, expectancy and manipulation lead to unforeseen difficulties, risks and hardships. The severe pain of many colics may be required for the stone to progress into manipulative distance. During this period dilatation of the ureter and pelvis and extensive kidney damage may occur. After the stone has reached the pelvic ureter, the turmoil of several cystoscopic procedures may be necessary for its removal. During this whole period there is the constant threat of acute infection and all that it may entail. Finally there is the chance of ultimate failure and the necessity for pelvic ureterotomy, a distinctly major and at times difficult operation. Such a sequence of events is indeed deplorable in cases in which the stone was first discovered in the lumbar ureter before any notable damage had occurred, before the patient had had any great hardship and in which there was or should have been opportunity for immediate and easy removal by simple and relatively minor lumbar ureterotomy.

If proper conception of what really constitutes the patient's welfare is borne in mind and mere prejudice in favor of the word conservatism is laid aside, careful consideration makes it very apparent that much of the so-called conservative management of ureteral stone is radically conservative, is without intelligent purpose and should be abandoned in favor of open operation. This assertion does not belittle the great value of these procedures when properly employed or detract from the credit due their originators. Merely it points out that their great worth can obtain only when the patient's welfare is their object and is not subordinated to zeal for their employment.

In the management of ureteral stone, either expectancy and manipulation or open operation must be determined on. In making this decision no general comparison between the two methods is applicable, for numerous factors, such as the size of the stone and the presence or absence of infection, have a bearing and are extremely variable among different cases. Considerations regarding the decision usually give no great importance to position of the stone and make no particular distinction between the magnitudes of lumbar ureterotomy and pelvic ureterotomy. Pelvic ureterotomy is always an operation of distinctly major character. Lumbar ureterotomy, as described in textbooks and as usually seen, is also a definitely major operation; it can and should be a relatively minor one. A method and technic for lumbar ureterotomy have been perfected and are described here that so minimize the operation that in this form it scarcely belongs to major surgery. Accordingly, in the present consideration of the two methods of management, and particularly in comparisons of expectancy and manipulation with open operation, pelvic ureterotomy is sharply distinguished from lumbar ureterotomy by this particular method, and position of the stone, whether it affords or does not afford opportunity for this procedure, becomes an important factor in determining between the two methods of management. Decision between the two methods thus should differ greatly depending on whether lumbar or pelvic ureterotomy is involved.

Read before the Section on Urology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

From the Urologic Services, Ancker Hospital and Miller Hospital, St. Paul, and the Department of Urology, University of Minnesota Medical School, Minneapolis.

Lumbar ureterotomy, even by former methods, should always be of more minor character than pelvic ureterotomy, but proper recognition and appraisal of this important point in the management of ureteral stone has not been properly emphasized and has not been practiced. In the urologic service of the Ancker Hospital and in private practice, the method I have per-

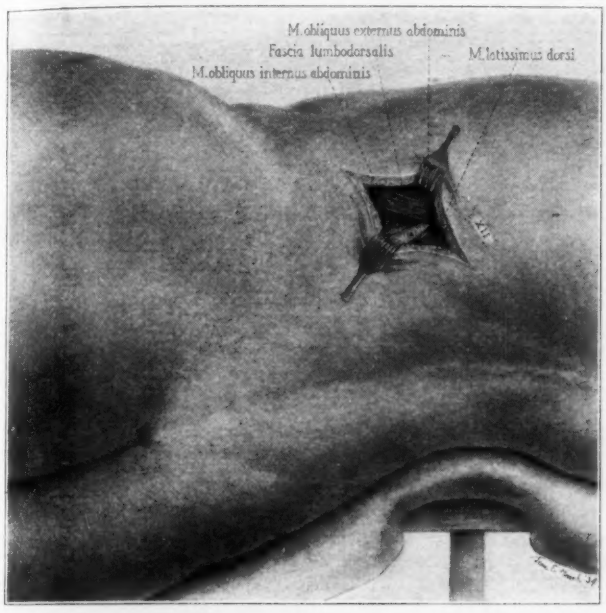

Fig. 1.—Lumbar ureterotomy: Incision. Patient in "kidney position." The "kidney elevator" of the operating table is raised only enough to widen the space between the twelfth rib and the ilium but not enough to put the muscles under tension. The incision from 10 to 12 cm. long, exposes the posterior edges of the external and internal oblique muscles and the anterior edge of the latissimus dorsi muscle. The lumbodorsal fascia presents between the muscles or is exposed by slightly separating them.

fected for lumbar ureterotomy has greatly emphasized for my associates and me the importance of this consideration, and we have come to the conclusion that, in the management of ureteral stone, opportunity for this procedure never should be neglected in favor of expectancy and manipulation, except in cases of stones so small that prompt passage or easy removal is almost certain. Accordingly, when a ureteral stone larger than a wheat kernel occupies a position above the pelvic brim it is removed at once by open operation, even though its small size meets the former criterion favoring management by expectancy and manipulation. Only stones of truly minute size are allowed to progress into the pelvic ureter for spontaneous passage or manipulative removal.

If the stone is already located in the pelvic portion of the ureter the considerations are quite different, for pelvic ureterotomy is a much more major procedure, and expectancy and manipulation should be employed unless the stone is of such large size as to give little prospect for the success of such management.

The technic of lumbar ureterotomy as described in textbooks and as usually observed in practice does not properly take advantage of anatomy toward the ends of simplicity, accuracy and minimal trauma. General anesthesia is employed, an unnecessarily large incision is made, muscles are divided, and the ureter is identified and exposed by unwarrantedly extensive and inaccurate dissection of retroperitoneal structures. Such a procedure is time consuming and accompanied by shock and risk in a superfluous degree. All this can be avoided in favor of local anesthesia, a small incision without division of muscle fibers, accurate identification and exposure of only the stone containing segment of ureter, and with almost no disturbance of retroperitoneal structures. When the operation is so performed it may be done in a brief time, with accurate closure of the ureter by suture and without drainage of urine from the wound. Such an operation imposes less risk and usually less discomfort than removal of the stone by expectancy and manipulation. The convalescence is rapid and there is a minimal period of disability.

The operation so performed takes properly into account the position of the ureter close to the vertebral bodies, its course through the fat containing space between the two layers of pararenal fascia (of Gerota) and the clean cleavage plane between the posterior layer of this fascia and the muscles of the abdominal wall—the quadratus lumborum and iliopsoas. The dissection is anatomically accurate and almost entirely by blunt opening of cleavage planes between structures.

TECHNIC OF OPERATION

Local infiltration anesthesia using 1 per cent procaine hydrochloride containing 10 drops of epinephrine per ounce (30 cc.) is made in the line of incision. The infiltration is extended deeply into the muscles on each side of the incision and into the retroperitoneal space of the flank. With the patient securely fixed in the

Fig. 2.—Lumbar ureterotomy: Freeing of muscles, exposure of lumbodorsal fascia. The undersurface of the internal oblique muscle is bluntly separated from the lumbodorsal fascia. This permits the internal oblique and external oblique muscles to be drawn well forward. The latissimus dorsi, already bluntly separated from the fascia, is drawn backward. A wide area of lumbodorsal fascia is exposed.

"kidney position," the elevator is raised only enough to widen the space between the rib and the ilium without putting the flank muscles under tension.

The incision, from 10 to 12 cm. in length, is placed on a line extending in vertical oblique direction from the middle of the twelfth rib toward the anterior supe-

rior spine of the ilium (fig. 1.). The level of the incision on this line is made appropriate to the level of the stone. Division of the skin and subcutaneous fat exposes the posterior edges of the external and internal oblique muscles and the anterior edge of the latissimus dorsi muscle midway between the twelfth rib and the iliac crest. These muscles are made freely mobile by bluntly separating their undersurfaces from the lumbodorsal fascia on which they lie (fig. 2). This permits the oblique muscles to be drawn well forward and the latissimus dorsi well backward, with exposure of a wide area of lumbodorsal fascia. The lumbodorsal fascia is now split parallel to its fibers with exposure of the posterior layer of the pararenal fascia (fig. 3). Except for a thin layer of intervening fat (pararenal), this fascia lies directly in contact with the muscles of the posterior abdominal wall, the quadratus lumborum and the iliopsoas. It passes posterior to the ureter and kidney and onto the vertebral bodies medial to them (fig. 4). This fascia and the anterior layer of pararenal fascia form an envelope completely enclosing the perirenal and the periureteral fat. Instead of immediately opening this fascia to approach the ureter through its surrounding fat, as is usually done, the dissection takes advantage of the clean cleavage plane between the posterior layer of pararenal fascia and the muscles on which it lies. By blunt dissection this cleavage plane is opened by gently stripping the fascia away from the muscles behind it. The stripping is continued mediad to the vertebral bodies, even disclosing the position of

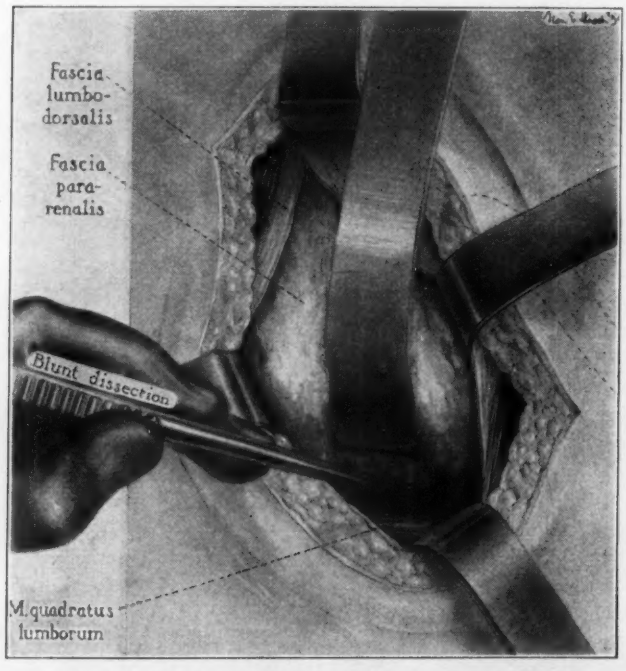

Fig. 3.—Lumbar ureterotomy: Separation of pararenal fascia from muscles of the posterior abdominal wall. The lumbodorsal fascia has been split parallel to its fibers, exposing the posterior leaf of pararenal fascia. The pararenal fascia completely invests the periureteral and perirenal fat. It lies in contact with peritoneum in front and muscles of the abdominal wall behind. The clean cleavage plane between the pararenal fascia and the muscles of the posterior abdominal wall is being opened by blunt dissection.

the aorta or cava, and in an upward or downward direction, as determined by the position of the stone. With the pararenal fascia and the contained fat elevated and held forward away from the muscles by a Deaver retractor, the ureter will be seen as a pale ribbon-like streak running longitudinally 3 or 4 cm. lateral to the vertebral bodies and immediately under the fascia, for most of the periureteral fat lies anterior to the ureter (fig. 5). The position of the stone is marked by a bulge in the course of the ureter, or if not evident in this way it may be felt by passing a finger along the course of the ureter. With a curved or somewhat hooked point scalpel a longitudinal incision is made through the fascia and ureter over the stone,

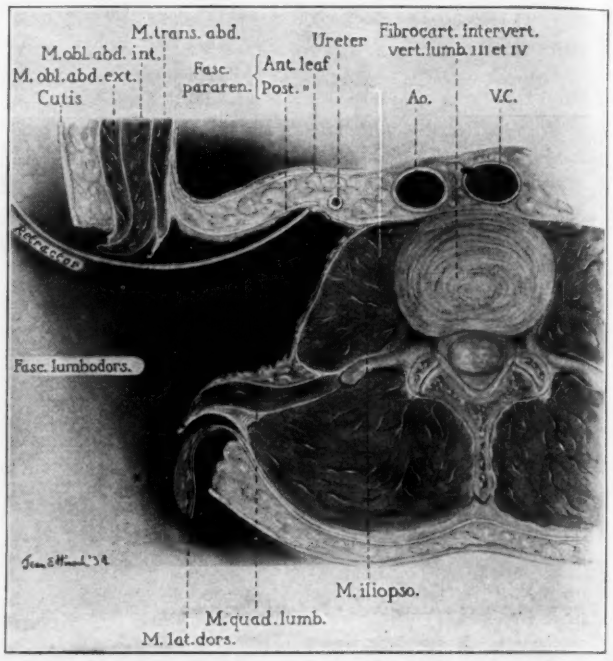

Fig. 4.—Lumbar ureterotomy: Horizontal cross section at level of proposed ureterotomy (intraperitoneal structures not shown). Note the relations of the pararenal fascia (fascia of Gerota) to surrounding structures and to the ureter and fat that it surrounds. Apart from incision of the skin and the subcutaneous fat and blunt splitting of the lumbodorsal fascia parallel to its fibers, the exposure thus far is accomplished entirely by blunt opening of cleavage planes between structures. Opening the pararenal fascia and the usual method of approaching the ureter by dissection through the fat are carefully avoided.

with removal of the latter. The ureter is not further explored, and bougies or olives are not passed into it. The opening in the ureter is securely closed by a continuous suture of 0000 catgut affixed to a fine atraumatic needle. The suture includes only the muscularis, with careful avoidance of the mucosa. The wound is closed without drainage (fig. 6). The lumbodorsal fascia is closed with a continuous suture, but the muscles fall into place and do not require approximation.

COMMENT

The operation as described can be performed in from fifteen to twenty minutes and with practically no shock. Thus far there has been no fatality, and the risk to life has appeared negligible. The postoperative courses have been entirely without incident; the patients have been out of bed on the second or third day and ready to leave the hospital on the fifth to the seventh day. By comparison with expectancy and manipulation, the risk, damage to the kidney, hardship for the patient, period of disability and uncertainty of outcome have been vastly less.

Usually a stone in the lumbar ureter produces typical symptoms and physical changes. When these are accompanied by a shadow in position of the ureter, the shadow usually can be localized and positively identified as a ureter stone by excretion urography, even in patients of very large stature. If changes demanding

further investigation are not thus disclosed, the hardship of cystoscopy and ureteral catheterization may be entirely avoided.

A stone in the lumbar ureter giving a radiographic shadow of 5 mm. or more in the greatest dimension should be removed at once by lumbar ureterotomy. When such a stone has already reached the pelvic ureter, expectancy and manipulation by all means should be tried. The hardship of the several colics required to advance it to this position, the damage to the upper urinary tract that has already occurred and the discomfort of the manipulative procedures to be employed cannot be undone. Such a stone and even ones of larger size may appear susceptible of easy removal. Attempts to remove it may not verify this. If the stone remains in this position sufficiently long, extensive changes requiring nephro-ureterectomy may occur, even in the absence of painful symptoms. It is a fool's enterprise to persist in manipulative procedures, frequent colics, continuing damage to the kidney and the grave risk of acute infection. Even pelvic ureterotomy is to be preferred to such a course and should be resorted to when one or at most two attempts at manipulation have failed.

In cases of ureteral stone in which there is or should have been opportunity for lumbar ureterotomy as described here, expectancy and manipulation should be considered only in cases of stones so small that there is almost positive assurance of passage or removal without difficulty. To accept the risks, hardships and uncertainties of expectancy and manipulation in any but such cases of lumbar ureter stone is bad judgment and betrays blind prejudice in favor of expectancy and manipulation. Such conservatism lacks intelligent purpose, is radically conservative and should be abandoned in favor of the truly conservative procedure described here.

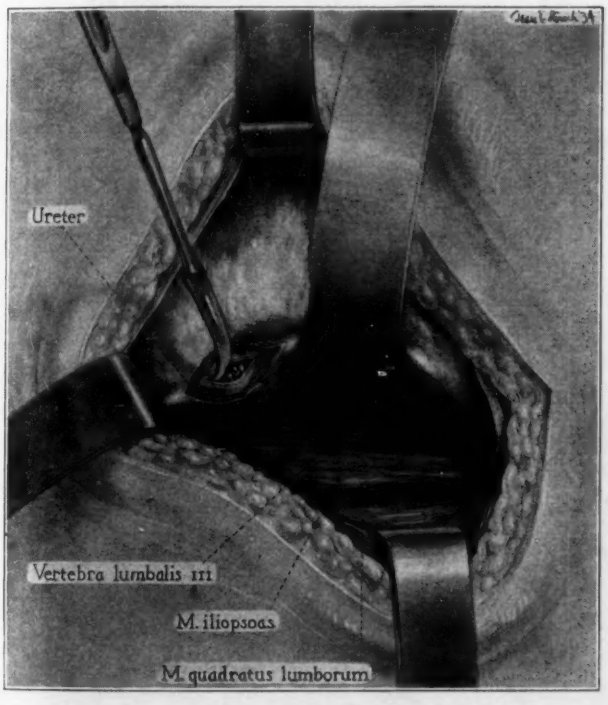

Fig. 5.—Lumbar ureterotomy: Exposure of ureter and removal of stone. The pararenal fascia has been stripped up from the muscles of the posterior abdominal wall mediad to the vertebral bodies. The ureter, covered only by the thin fascia, is readily identified as a pale ribbon-like streak. A stone within the ureter is marked by a bulge or may be identified by passing a finger along its course. The pararenal fascia overlying the ureter has been split and the ureter is being incised over the stone. The opening in the ureter will be closed with a continuous suture of 0000 catgut in the muscularis with care not to include the mucosa.

SUMMARY

1. Management of ureteral stone by expectancy and manipulation has been employed too extensively. Their morbidity, mortality and hardships are underestimated and their just purpose is often subordinated to mere zeal for their use. Such methods are truly conservative only when they best serve the patient's welfare.

2. Lumbar ureterotomy should always be of more minor character than pelvic ureterotomy. This fact is not properly recognized. It always should be taken into account in determining between "expectancy and manipulation" and "open operation."

3. Lumbar ureterotomy, as usually described and observed, is a distinctly major operation and does not properly take advantage of anatomy toward the ends of simplicity, accuracy and minimal trauma.

4. The improved method for lumbar ureterotomy that has been described takes advantage of anatomy toward the ends of simplicity, accuracy and minimal trauma and greatly minimizes the procedure.

5. A lumbar ureter stone of greatest dimension 5 mm. or more should be removed at once by lumbar ureterotomy, as described here. Only stones of truly minute size should be allowed to pass into the pelvic ureter for spontaneous passage or manipulative removal.

229 Lowry Building.

Fig. 6.—Lumbar ureterotomy: Closure of wound. The "kidney elevator" of the operating table has been lowered, permitting the wound edges to approximate themselves. A continuous suture of number 1 chromic catgut is used to close the lumbodorsal fascia. The muscles fall into place and need not be sutured. In most cases even a superficial drain is not left in the wound.

ABSTRACT OF DISCUSSION

DR. WILLIAM J. ENGEL, Cleveland: I am in almost complete agreement with Dr. Foley on manipulation of stones in the ureter. The multiplicity of methods advocated for manipulative removal of stones in the ureter is proof of the inadequacy of any one procedure. I have employed multiple catheters, the spiral stone extractor and dilation of the ureter below the stone with bougies and have been impressed with the infrequency with which the stones have been satisfactorily removed by these

means. In my experience manipulative procedures often give rise to sharp reactions associated with chills, fever and rather marked prostration. Manipulation may well traumatize the ureter and ureteral mucosa sufficiently to produce stricture. Additional disadvantages are the prolonged period of time that is usually necessary to secure the passage of the stone, during which time the patient is in constant fear of recurrent colic and the period of morbidity is distinctly increased by the manipulative procedures. Too often final resort to open operation is necessary after the patient has been exhausted by the preliminary procedures. I have favored open operation for the removal of stones in the ureter in the vast majority of instances. The situation of the stone is important in making the decision. Contrary to Dr. Foley's experience, I have found most stones in the lower or pelvic portion of the ureter. In a series of 268 cases, reviewed recently, the stones were in the pelvic portion in 205 instances. I must disagree with the author that removal of a stone from the pelvic portion of the ureter is an operation of great magnitude. The operation described by Dr. Lower consists of a muscle-splitting incision carried out entirely extraperitoneally and is not difficult. Its success depends on extremely careful dissection of the ureter and the avoidance of bleeding. The external and internal oblique muscles are divided, much as in a McBurney incision, and the peritoneum is retracted medially until the ureter is found. Then by picking it up with Allis forceps and dissecting it down, one can follow the ureter all the way down to the bladder. When the stone has been located it is fixed between two clamps and then a small longitudinal incision is made over it and the incision is closed with drainage. I have not had the courage to close these wounds without drainage, as Dr. Foley has. In the series of operations for pelvic ureteral stone, the average postoperative stay in the hospital was ten days, although many patients have been dismissed on the fifth, sixth and seventh day. In an occasional case in a woman, when the stone is stuck in the lower pelvic ureter and can actually be palpated on vaginal examination, the cervix is drawn to one side, a little longitudinal incision is made, and the stone is palpated and removed. These patients are out of the hospital sometimes within four or five days.

DR. F. C. HERRICK, Cleveland: I do not agree with the author that ureteral calculi should always be operated on as soon as diagnosed. Dr. Crowell of Charlotte, N. C., recorded his method of removal of these stones by the passage, first, of a small ureteral bougie, followed up by another, perhaps two or three or four bougies, followed possibly by a small catheter or a larger catheter, so that he can get at times three bougies or catheters by such a stone. This is followed by injection of a small amount of oil and a wait of twenty-four hours, when these stones skid, as it were, down the bougies. I think that 75 or 80 per cent can be gotten that way. I think that one is too hasty in taking the step of immediate surgical removal. I remember a case first diagnosed by Dr. Braasch of Rochester, Minn. A stone was carried around for some twelve or fifteen years. I got it at the lower end of the ureter. It was huge, larger than one would expect to pass by this method. The patient was so much relieved that he left the hospital at once and would not let me get it out of the bladder. Dr. Lower took it out of the posterior urethra by incision. It came down, nevertheless, by this bougie method. Twenty-five years ago I described in Binney's Surgery an operative technic for access to the lower ureter. It was an intermuscular incision from an inch above the anterosuperior spine in a line with the opposite spine of the pubis. It allows one to split both oblique muscles and affords easy access to the ureter. Although I devised that method and used it a number of times, I have rarely taken out a ureteral stone by incision since the idea of the catheters and the bougies up the ureter came along. I have gotten almost all of them the other way. It does not seem reasonable or safe to make an abdominal incision, open the ureter in the presence of frequently infected urine, close the ureter and the abdomen without a drain, and send the patient home in five or six days as has been suggested by Dr. Engel. The danger of leak and infection is such that, although a primary closure may result in primary union, a small cigaret drain to the site of the ureteral opening appears advisable.

DR. FREDERIC E. B. FOLEY, St. Paul: In spite of the facility with which Dr. Herrick and Dr. Engel perform pelvic ureterotomy, I am convinced that the operation for removal of a stone from the ureter down close to the bladder is technically a much more formidable procedure than lumbar ureterotomy of the sort I have described. The reason so many more stones are seen in the pelvic ureter than in the lumbar ureter is not the fault of the urologist but the fault of the general practitioner who sends the patient to us. When pain suggestive of renal or ureteral colic occurs, a urinary tract x-ray film should be made at once. I make a plea with the general practitioners to recognize these lumbar ureter stones promptly and to have them removed in the safe, quick and easy way I have described rather than to accept the hazards and uncertainties of expectancy and manipulation.

AN INVESTIGATION OF THE NEW BIOLOGIC TEST FOR HORMONES IN PREGNANCY URINE

PRELIMINARY REPORT

ISRAEL S. KLEINER, PH.D.
ABNER I. WEISMAN, M.D.
AND
HARRY BAROWSKY, M.D.
NEW YORK

Kanter, Bauer and Klawans,[1] basing their work on previous experiments of Tozawa,[2] Fleischmann and Kann [3] and Szusz,[4] have recently reported experiments on a new biologic test for hormones in pregnancy urine in which they intimate the usefulness of the female bitterling in the diagnosis of pregnancy. They used the lengthening of the female ovipositor as a criterion of positive reaction for the hormones of pregnancy urine and suggested a method of standardizing the female bitterling, believing that "it was necessary to know in advance whether each fish was capable of responding positively to urine from a known pregnant woman and that the same fish would not react to the urine from a patient who was not pregnant."

In their technic a standardized fish (presumably a Japanese bitterling) was placed in a 2 liter bowl half filled with water, to which 4 cc. of the urine to be tested was added. After seventy-two hours, final readings were taken. A lengthening of the ovipositor from a normal of from 2 to 5 mm. to from 15 to 25 mm. was considered a positive reaction. Thirty-one cases of doubtful pregnancy were reported, with twenty-seven absolutely checked by the Friedman test and with four discrepancies between the two tests. These results seemed so promising in the face of the fact that Szusz reported such unfavorable results, using a wider range of controls, that we decided to repeat their work.

We were fortunate enough to obtain a supply of female bitterlings (Rhodeus amarus) from the New York Aquarium. This fish resembles the Japanese bitterling very closely in size and appearance and has the same sexual apparatus and the same breeding habits. Each fish was examined and was said to be mature and

From the Department of Physiology and Physiological Chemistry of the New York Homeopathic Medical College and Flower Hospital.

1. Kanter, A. E.; Bauer, C. P., and Klawans, A. H.: A New Biologic Test for Hormones in Pergnancy Urine, J. A. M. A. **103**: 2026 (Dec. 29) 1934.

2. Tozawa, Tomizya: Experiments on the Development of the Nuptial Coloration and Pearl Organs of the Japanese Bitterling, Folia. anat. japon. **7**: 407-417, 1929.

3. Fleischmann, Walter, and Kann, Susanne: Ueber eine Funktion des weiblichen Sexualhormons bei Fischen (Wachstum der Legerohre des Bitterlings), Arch. f. d. ges. Physiol. **230**: 662-667, 1932.

4. Szusz, Ferenc: Researches Conducted with Rhodeus Amarus for Determination of Early Pregnancy, Orvosi hetil. **77**: 905 (Oct. 7) 1933; Untersuchungen mit Bitterlingen zur Erkennung der Schwangerschaft, Monatschr. f. Geburtsh. u. Gynäk. **96**: 292 (March) 1934.

in good health,[5] with the ovipositor presenting externally in the quiescent state from 2 to 5 mm. in length. The first thing which came to our attention was that, after we had transported the fish and placed them in our stock tanks, two out of fifty showed elongated ovipositors from merely being handled. These ovipositors were at least 25 mm. in length and regressed overnight after being placed in our large tank.

The question of the necessity of "standardization" was first considered. According to Kanter, Bauer and Klawans the fish should be standardized before use. They maintain that the test fish must show a positive elongation produced by a known pregnancy urine and that the same fish should not react to a urine from a patient who is not pregnant. In our opinion standardization is neither feasible nor scientific, and our results bear out this statement.

TECHNIC

A mature fish was placed in a 2 liter bowl containing 1,500 cc. of water. Six cc. of the urine to be tested was added to each bowl. The fish were observed at twenty-four hour intervals for seventy-two hours. Elongation of the ovipositor to at least 25 mm. was taken as a positive reaction, a length of 15 mm. was considered a moderate enlargement (doubtful), about 10 mm. was called slight enlargement, (probably negative), and a negative reading was an ovipositor measuring 5 mm. or less. Forty-six fish were placed in individual aquariums. Five groups of urine were tested. After forty-eight hours most of the fish had either reacted positively or not at all and the seventy-two hour reading showed little or no variation from the forty-eight hour reading.

RESULTS

Group 1. Twenty-one female bitterlings were tested with known pregnancy urines. Of these, eight tests were negative, nine were definitely positive and four showed some enlargement of the ovipositor.

Group 2. Urines from seven normally menstruating nonpregnant women were tested by the fish method, with the result that four gave positive ovipositor tests.

Group 3. Samples of urine from four different normal males were tested, with one positive result. This positive result was so striking and occurred so rapidly (before forty-eight hours) that we obtained another specimen from the same individual, a healthy normal man, aged 21. This was tested on six fish in separate aquariums with positive results in every fish within forty-eight hours.

Group 4. Three samples were obtained from women who were in the postclimacteric period and had not menstruated for from four to seven years. Each urine of this group was tested on two fish. One urine gave a positive fish test.

Group 5. The urines of group 1 (from known pregnancies) were boiled and tested in the same way. In some cases two boiled urines were mixed and tested. The results were quite irregular, some boiled urines giving positive reactions and some negative.

COMMENT

It will be seen that only nine of the twenty-one urines from pregnant women gave definitely positive reactions. Of seven from normally menstruating nonpregnant women, four gave positive reactions. One male urine of the four tested was positive, and a later specimen from the same male gave positive reactions in every one of the six fish tested. Urines from women who had passed the menopause were positive in one of three cases. Boiled urines from pregnant women were positive in some instances and negative in others.

These results agree with those of Szusz and indicate that this biologic reaction is not a specific test for pregnancy as Kanter, Bauer and Klawans intimate. Moreover, the latter authors do not report as great a variety of controls as we have and as Szusz previously reported. Our finding that nonpregnant female urines, postmenopausal urines, male urines, boiled pregnancy urines, and physical disturbance may bring about lengthening of the ovipositor would seem to show that a standardization of a fish, as these authors suggest, would be extremely difficult if not impossible. Whether the phenomenon is due to the presence of estrogenic substance or to some other hormone or to some other substance remains to be determined. We are continuing the investigation.

5. Mr. W. Christopher Coates, curator of tropical fish of the New York Aquarium, obtained and selected the fish for us and gave us valuable information regarding the care of the fish in our laboratory.

POISONING DUE TO THALLIUM SULPHATE

EDWIN P. JORDAN, M.D.
CHICAGO

Poisoning with thallium is still a rarity as contrasted with that of lead and mercury, owing in all probability to the relatively infrequent use of the former for industrial purposes. The toxicity of thallium is however well recognized and cases of poisoning have been described in both the domestic and the foreign literature.[1] Because of the infrequency, the strange symptomatology, the fact that treatment is not well standardized, and the probability that more widespread commercial use of thallium compounds is foreshadowed, the case reported here is of exceptional interest.

REPORT OF CASE

The patient was a man, aged 38. I was called to his home, June 24, 1934. The following history was obtained: The patient's previous health had been good, the only previous complaint being of relatively easy gastro-intestinal upsets and moderately frequent sore throats. About June 10 the patient had a slight sore throat lasting a few days. June 14 the patient, who is connected with the motion picture industry, went to a laboratory in which experiments were being performed on the development of films. While there he had a lunch consisting of a sandwich and coffee sent up from a nearby restaurant. The sandwich was unwrapped and placed on the table between bites. He noticed a crunching in his mouth, and after the sandwich was eaten a metallic taste. He asked the laboratory worker what substance was being used, and was told thallium (later determined as chemically pure thallium sulphate). He was somewhat worried for a few days but nothing occurred to remind him of metallic poisoning.

For the sake of clarity, the course is presented in chronological order according to the number of days following the ingestion of the thallium.

2. (noted only in retrospect). The stools were soft to semiliquid but there was only one a day. This condition persisted for four days.

3. There was moderate loss of appetite. The patient's wife noticed that his face was "flaming."

7 and 8. He began to notice a sensation of "going to sleep" in the toes. There was slight pain under the manubrium of

1. Munch, J. C.: Human Thallotoxicosis, J. A. M. A. **102**: 1929-1934 (June 9) 1934.

the sternum. In retrospect the patient believed he had some fever at this time.

8. The patient went to bed because of pain in his legs. There was a brief return of the metallic taste in the mouth.

10. This was the day of my first visit. The patient was complaining of pain and soreness at the tips of all the toes, in the proximal joints of the toes, especially the big toes, and in the knees anteriorly below the patella.

The physical abnormalities were relatively few. The blood presure was 120 systolic, 86 diastolic. The temperature was 99.4 F. The pulse was 80. All the toes were sensitive at the tips and painful to pressure and to passive motion of the proximal joints. The metatarsophalangeal joints of both feet were sensitive to pressure and felt hot and slightly swollen. There was moderate tenderness to pressure over the subpatellar region. The knee motions were free and caused only slight pain. Muscular strength of the leg muscles was good. The knee and ankle tendon reflexes were normal. There were no abnormalities noted in the lungs, heart or abdomen. The face was flushed. There was slight mental confusion. The tongue was moderately coated. The teeth and gums were normal except for several crowns. The throat was moderately reddened and there were large tonsils present. The pupils reacted to light and in accommodation. The patient appeared in general more prostrated than was accounted for by the physical changes found. My impression was one of rheumatic fever (atypical) or infectious arthritis. The patient was given sodium salicylate with sodium bicarbonate, of each 4 Gm. daily, as an attempted therapeutic test.

11. Subjectively the feet were slightly less painful. The temperature was 99.6 F. The first complaint of marked sleeplessness was reported. The patient was still confused and prostrated. The urine was normal. The sedimentation index was 10 (Cutler method).

12. The feet were about the same. The patient complained of sharp pains in the epigastric region. He vomited several times. There was tenderness over the epigastrium. Sleeplessness was severe. He felt listless but was unable to sleep. His vision was blurred for about twenty-four hours. The pulse was 104. Salicylates were stopped. Attempted administration of bismuth subcarbonate was without effect on the nausea or gastric pain. Attempted induction of sleep on usual hypnotics was without effect. Morphine sulphate, one-sixth grain (0.01 Gm.), was given hypodermically.

13. The temperature was 100.2 F., the pulse 100. The white count was 14,200, with 77 per cent polymorphonuclears, 21 per cent lymphocytes and 2 per cent monocytes. The hemoglobin was 100 per cent (Dare). The patient was unable to retain food or fluids. There was marked nervousness and sleeplessness. The posterior palate showed some diffuse redness and punctiform purple red spots. There was no complaint of sore throat. An enema was followed by a retention enema at night.

14. The pulse was 104, the temperature 99.4 F. The symptoms remained the same except for some decrease of pains in the feet and knees. The patient was given no food but retention enemas every four hours.

15. Pains in the epigastrium were decreasing. The patient was able to take fluids freely with only slight discomfort. Mental confusion was somewhat lessened. Small amounts of bland foods were retained.

16. The temperature was staying between 99.2 and 99.8 F. The pulse was 104. The white count was 12,000.

17. The head hair began to fall out freely. The patient was slightly jaundiced. He still complained of sleeplessness and some gastric distress, especially after taking food. There was slight desquamation of the hands.

18. The pulse was 84, the temperature 99.4 F. There was no albumin in the urine. There had been no vomiting for five days. The joints were less painful. The patient was still listless and complaining of sleeplessness. Gastric pains were severe in the evening and at night. Sodium thiosulphate, 0.5 Gm. intravenously, was administered. The hair was still falling rapidly.

19. The pulse was 100. The patient noticed a "boiling sensation" in the stomach after eating. A twenty-four hour urine specimen was collected and identification of thallium was attempted by Miss Isaacs. In spite of the cooperation of the physics department of the University of Chicago (Professor Gale), none was ever found. Sodium thiosulphate 0.5 Gm., was administered. Eight drops of dilute hydrochloric acid was given with meals.

20. The patient vomited for the first time in a week. No gross blood was seen. The vomitus was examined for hydrochloric acid. There were 28 points of free acid present. Gastric pains were much worse. Dr. L. C. Gatewood saw the patient in consultation. From this time on the temperature varied between 98.6 and 99.6 F. but gradually returned to normal. The pulse was 104. The hair was still falling out and had become scanty. The jaundice was practically gone. The chief complaints were severe gastric pains and sleeplessness. No food or fluid was taken on this day. Sodium thiosulphate, 0.5 Gm., was given.

21. The pulse was 120. The white count was 18,300. Jaundice was decreasing. No food was taken. There was no vomiting, but gastric pain was still severe. The patient was restless and still unable to sleep. He stated that the desire to urinate preceded the starting of the stream by about an hour. There was some pain at the beginning of the stream but none later. The stream was normal, however, when started. Sodium thiosulphate, 0.5 Gm., was given.

22. The pulse was 104. Fluids were taken freely. The patient vomited once. Gastric pain was present but slightly less severe than formerly. The hair was still falling out. The beard grew slowly the past week. Pilocarpine hydrochloride 1 per cent, five drops four times a day, was given. The tongue was slightly coated; the gums were normal. All-day suckers were given. No sodium thiosulphate was administered.

23. The pulse was 108. The usual afternoon nausea and vomiting occurred. The jaundice disappeared. Potassium iodide was given by mouth.

24. The pulse was 116. The patient was nervous and restless, and he complained of sleeplessness. He had been able to retain little by mouth. He was still moderately confused.

25. The pulse was 108, the blood pressure 156 systolic, 104 diastolic. Pilocarpine hydrochloride, five drops four times a day, was given.

26. The pulse was 128. Gastric pains occurred at intervals. The patient was unable to retain food. Iodides were stopped.

27. For the following week the pulse varied between 100 and 108. The blood pressure was 152 systolic, 118 diastolic. The patient's memory was better. The tongue was still coated. The abdomen was relaxed. There was moderate tenderness over the epigastrium. Gastric pains were still severe at night.

28. The blood pressure was 136 systolic, 104 diastolic. The hemoglobin was 118. The urine contained a trace of albumin (acetic acid). The white count was 11,800, with 64 per cent polymorphonuclears, 33 per cent lymphocytes, 2 per cent eosinophils, and 1 per cent monocytes. There was no bluish discoloration of the gums. Moderate tingling of toes and tenderness was still present.

29. The tongue was almost clear. The patient was taking food and fluids well. He was still unable to sleep.

30. The patient's memory was practically normal. He had not vomited for three days. Gastric pains were much less severe and less constant.

31. The patient felt tired and weak but was eating well.

32. The patient noticed more frequent but slightly painful micturition while taking pilocarpine. The hair was apparently not falling out any more. A few strands were left. The beard was growing more rapidly (?). Sleeplessness was the predominant symptom.

33. The patient felt weak and tired.

34. The pulse was 96, the blood pressure 120 systolic, 88 diastolic. The hemoglobin was 100, the white count 8,000, the urine normal. Sodium thiosulphate, 0.5 Gm., was given intravenously.

36. The pulse was 104. There was slightly increased pain in the toes.

37. The pulse was 108. The hair was beginning to grow on the head (?). Urination was still slow in starting and slightly painful before the stream began to flow.

42. The pulse was 100, the blood pressure 138 systolic, 100 diastolic. The white count was 10,000. Pain was still present at the ends of the toes.

43. The pulse was 96. The patient's general condition was improving. He had been taking potassium iodide for about twenty-four hours.

45. The pulse was 106, the blood pressure 134 systolic, 106 diastolic. There were severe cramps in the muscles of the thighs and calves.

51. The white count was 9,800, the urine normal. The condition remained about the same. There were no important developments in the subsequent course. The convalescence was gradually extended. The hair grew back normally. The last remaining obvious symptom was tenderness and numbness of the toes. It was about three and one-half months after ingestion of the thallium before the patient was able to resume his work. The blood pressure when the patient was last seen, October 19, was 108 systolic, 74 diastolic. The pulse was 84. The urine was normal.

SUMMARY

In a case of human thallium intoxication, the origin was almost certainly that amount of chemically pure thallium sulphate accidentally picked up by a sandwich placed on a table on which experiments had been performed with this substance. So far as can be determined, this is the first case of industrial thallium poisoning reported from the motion picture industry.

The symptoms of the poisoning began gradually. The most important in order of appearance were neuritic pains in the toes and feet, mental excitement and confusion, sleeplessness, epigastric pains and vomiting, and falling out of the hair of the head. These were associated with other signs of profound physiologic disturbance; e. g., fever, rapid pulse and increased blood pressure.

Treatment, after correct diagnosis had been made, was symptomatic with the addition at various times of sodium thiosulphate, iodides, hydrochloric acid and pilocarpine, all of which have been recommended. The alarming exacerbation of symptoms following the administration of sodium thiosulphate and iodides in the earlier phase of the illness was most striking and deserves special emphasis. In this case hydrochloric acid appeared not to be indicated, as free acid was present in the vomitus.

COMMENT

There are two main problems relating to thallium poisoning, both amply demonstrated in the case reported. The first involves the early diagnosis and the second the treatment. The rarity of thallium poisoning makes one hesitate to diagnose this condition in the face of early symptoms simulating other much more common diseases. Thus, in the present case the initial impression was rheumatic fever (apparently a common mistake)[2] in spite of the volunteered history of alleged thallium ingestion on a sandwich. Furthermore, a description of swelling of the metatarsophalangeal joints was not obtained in the first articles consulted but was later found mentioned in the article by Goodman.[3] The most striking and absolute clinical diagnostic feature is falling out of the head hair, but this does not usually occur until sometime during the third week following the ingestion of the poison. In the reported instance, falling of the hair began on the seventeenth day. There was hence, and apparently often is, a prolonged period between the occurrence of poisoning and correct diagnosis. More widespread knowledge of the high toxicity of this substance should serve to reduce this delay in a majority of the cases.

Treatment based on animal experiments has been outlined by Munch.[4] This consists in (1) intravenous administration of sodium iodide until thallium has practically disappeared from the twenty-four hour urine, (2) sodium thiosulphate intravenously to induce gradual elimination of thallium, (3) pilocarpine and calcium salts intravenously, and (4) hydrochloric acid orally. Leschke[5] says: "The best agent for the treatment of thallium poisoning is sodium thiosulphate given slowly by intravenous injection in a daily dose of 20 cc. of a 3 per cent solution in distilled water. In addition, the water excretion should be stimulated by means of frequent drinks of tea and through purging. In acute cases the stomach should be thoroughly washed out, and large amounts of milk given." These two citations serve as examples of the wide discrepancy in recommended treatment.

It is obviously impossible to formulate any rational method of therapeusis from the observation of one case. Certain aspects that may be of importance are nevertheless suggestive. There was a marked exacerbation of symptoms following administration of sodium thiosulphate and later following sodium iodide taken orally. Both of these may have been fortuitous, but both occurred at times when the patient had become almost symptom free. It seems probable, therefore, that these substances have a demobilizing action on thallium, tending to bring it out of the bones or other depots into the circulation, as is the supposed action in lead and certain other metallic poisons. If this hypothesis is correct, the time element and acuteness or chronicity of the intoxication become of paramount importance. With the atomic weight of thallium at 204, lying between that of mercury and of lead, its behavior might be expected to be at least somewhat similar. A more rational treatment, subject to real investigative procedures, in the acute and subacute forms at least, would seem to be the administration of calcium and alkalis as in lead poisoning, with the object of removing thallium from the circulation. It is necessary to note, however, that Lehman and Gaffney[6] did administer calcium chloride to one patient but after five injections the symptoms became worse and this treatment was discontinued. Later sodium thiosulphate and iodides might be given cautiously to attempt the reversal of this process with gradual elimination of the metal. Admittedly this is speculative but seems at least as rational as the administration of five drugs simultaneously each with an uncertain mode of action.

Finally, it should be reemphasized that the extension of industrial use of thallium, in this case in the developing of motion picture films, constitutes an important potential danger and may make intoxications of this nature much more frequent.

NOTE.—The patient was seen in my office, Jan. 27, 1935. At this time his only complaints were moderate listlessness and inability to walk fast because of stiffness in his feet. There was no pain. March 1 he committed suicide by shooting himself in the head. Judging from the arrangements made for this event, there was no evidence of mental confusion remaining from the illness described in the report. Although several cases of acute thallotoxicosis have resulted from attempted suicide, in this instance there were no known motives for suicide at the time of the poisoning.

8 South Michigan Avenue.

2. Hamilton, Alice: Industrial Toxicology, Harper's Medical Monographs, New York, Harper & Brothers, 1934.
3. Goodman, Herman: Thallium Acetate, Its Toxicity and Depilatory Action, New York State J. Med. **32**: 1307-1313 (Nov. 15) 1932.
4. Munch, J. C.: Antidotes: III. Thallium, J. Am. Pharm. A. **23**: 91 (Feb.) 1934.
5. Leschke, E.: Clinical Toxicology, London, J. and A. Churchill, 1934.
6. Lehman, James, and Gaffney, Leo: Thallium Poisoning, Ann. Int. Med. **6**: 60 (July) 1932.

Clinical Notes, Suggestions and New Instruments

EMERAUDE PERFUME DERMATITIS

NORMAN TOBIAS, M.D., ST. LOUIS
Instructor in Dermatology, St. Louis University School of Medicine

Perfume dermatitis is not common in this country when one considers that thousands of bottles of various types and grades of perfume are sold annually. It is possible that many cases are overlooked by the physician; others may be mild in character and detected by the patient herself. Unfortunately the literature contains very few reports of true perfume dermatitis.[1] These cases are fairly common in France.

There are three types of dermatitis that may be caused by perfume. Dermatitis venenata can be produced by irritants in the perfume coming in contact with the skin at the first application without the intervention of hypersensitivity. This type simulates benzene or turpentine dermatitis (examples of universal cutaneous irritants) and is similar to a chemical burn. At first local, it may spread and become generalized, as a result of autosensitization, a phenomenon first described by Whitfield[2] in 1930. Other cases are due to hypersensitization to certain ingredients such as aldehydes, orris root or dyes after prolonged contact (contact or eczematous dermatitis). A third type of perfume dermatitis first described by Freund[3] in 1916 is called berlocque dermatitis, a streaked erythematous eruption followed by pigmentation and produced by the action of sunlight on oil of bergamot, a common ingredient of toilet waters and cologne.

Schwartz[3a] reports five cases of perfume dermatitis among twelve girls whose occupation consisted of bottling perfume. In one of the cases the eruption was severe enough to cause the girl to give up her occupation. In two of the perfumes manufactured there were five possible skin irritants, one of which, linalool, a terpene alcohol obtained from the Mexican oil of linaloe, was found by the use of patch tests to be the probable cause of the dermatitis.

REPORT OF CASE

Mrs. A. D., aged 33, a white housewife, in May 1934 had an acute dermatitis involving the left subclavian and left mammary regions from the sternum to the extreme lateral margin of the chest. The condition began two and one-half weeks before consultation as an erythematous eruption, which became vesicular in forty-eight hours. The onset was fairly sudden. Various simple home remedies had been used without any effect. The patient demanded relief from the annoying pruritus.

The previous history was negative for hay fever, asthma and urticaria. There was no history of drug idiosyncrasy either by ingestion or by local application. In March 1932 the patient had consulted me for a mycotic infection of the left hand, which disappeared following seven roentgen treatments.

The physical examination did not reveal any functional or organic disturbances. It is noteworthy that the entire skin was moist from perspiration. Examination of the urine gave negative results, and the red and white counts were normal. No focal infections could be determined in the teeth, tonsil or sinuses.

The condition immediately impressed me as being a dermatitis of external origin, and questioning on the first day brought out the fact that the husband was using two preparations on his hair, ointrasan (a proprietary medicated oil) and a sulphur-salicylic pomade. The possibility of an environmental dermatitis suggested itself and patch tests were made with these substances, but both were negative.

In spite of local, soothing, astringent therapy, the eruption continued to spread. After repeated questioning on the second visit, the patient stated that she had been using Emeraude perfume daily for the past six months. A small quantity was sprayed on the dress over the left shoulder each evening. A patch test was immediately performed on the back with a Bloch 3 plus reading at the end of twenty-four hours (erythema and vesiculation). After discontinuance of the perfume the eruption entirely disappeared in five days. The perfume supplied by the patient was used as a patch test on four normal controls with negative results. No attempt was made to make patch tests on the paitent with varying dilutions of the perfume.

COMMENT

Perfumes are complex products. The better ones on the market may contain as many as twenty-five ingredients in varying proportions, the exact formulas being carefully guarded trade secrets. It is difficult, therefore, to determine the specific sensitizing or irritating substance in the individual case. Most perfumes consist of (*a*) a coloring, (*b*) a fixative, (*c*) a solvent, (*d*) essential oils (fortifying) and (*e*) odor—animal, vegetable or synthetic.

According to Jausion,[4] perfume dermatitis may result from sensitization to anilines or acetoaldehydes or from photosensitivity to the essential oils or to the coloring matter. There is usually an abnormal condition of the skin, or what the French call the terrain, which acts as a predisposing factor. The conditions may be (1) previous sensitivity to other substances, (2) seborrheic dermatitis, (3) perspiration and (4) friction. In the case described, perspiration was an important factor, as the summer was abnormally hot in St. Louis.

DIAGNOSIS

The diagnosis of perfume dermatitis rests on careful questioning and on the clinical evaluation of the following points, which Hollander[5] has stressed:

1. Location of the eruption. The bulk of the eruption will appear at the site of application (ears, nipples, chest, sides of neck or axillae). Generalization due to autosensitization occurs as the result of scratching or rubbing.

2. Sudden appearance. The onset is usually mild in hypersensitive individuals and severe if due to local irritant reaction.

3. Intense itching and burning. The intensity of these symptoms is usually out of proportion to the extent of the eruption and may be severe in neurotic patients.

4. Time element. According to Sulzberger and Kerr,[6] eczematous sensitiveness consists of two periods of development: (*a*) the period of incubation or formation of sensitivity, which is extremely variable from months to years, and (*b*) the period of reaction time, which is usually constant and lasts from twenty-four to seventy-two hours.

5. Type of skin eruption. The berlocque type of perfume dermatitis is usually linear and followed by pigmentation after exposure to sunlight. The contact type is at first localized over the site of application and may be erythematous or vesicular, depending on the degree of hypersensitiveness and the concentration of the antigen.

6. Diagnosis. The use of the patch test in skin testing is imperative in this type of case as the sensitization is epidermal. A square of white blotting paper 1 cm. by 1 cm. is saturated with the perfume to be tested and then applied to the skin over the back or over the V of the neck. The site is examined at the end of twenty-four, forty-eight and seventy-two hours to determine the degree of reaction.

7. History. Last but not least, incessant and repeated questioning is always necessary to elicit the facts. If cosmetic dermatitis is suspected, the type and name of the various cosmetics, the frequency and time of use and the time of greatest intensity must be determined. In perfume dermatitis, the odor of the perfume that the patient is using should create suspicion.

CONCLUSIONS

Perfume may act as an eczematogenic agent under certain conditions and provoke a contact or eczematous dermatitis. Some cases of perfume dermatitis may be due to the fact that

1. Cole, H. N.: Investigation of Injuries from Hair Dyes, Dyed Furs and Cosmetics, J. A. M. A. **88**: 397-399 (Feb. 5) 1927. Babalian, M.: Dermites cervicales et sensibilisation par les fourrures teintes et les parfumes, Bull. soc. franç de dermat. et syph. **37**: 496-504 (April) 1930.
2. Whitfield, A.: Autosensitization in Eczema, Eighth International Congress on Dermatology and Syphilology, Copenhagen, 1930, pp. 142-145.
3. Freund, E.: Ueber bis her noch nicht beschriebene kuesliche Hautverfarbungen, Dermat. Wchnschr. **53**: 931, 1916.
3a. Schwartz: Skin Hazards in American Industry, Pub. Health Bull. 215.
4. Jausion, M. in discussion on Babalian.[1]
5. Hollander, Lester: Dermatitis Produced by Cosmetics, J. A. M. A. **101**: 259 (July 22) 1933.
6. Sulzberger, M. B., and Kerr, P.: Sensitizations of Eczematous Type: Ten Selected Cases Illustrating Some Uses of the Patch Test, J. Allergy **4**: 326 (May) 1933.

certain batches may be more concentrated than usual, or irritants may develop in the perfume from age or from the action of light. Since most good perfumes are tested on the skin clinically by the manufacturers, the question of individual sensitization and preexisting changes in the skin rendering it more susceptible to damage must be considered. Once the cause is suspected, the patch test is valuable in proving the diagnosis.

Without entering into a discussion of the antigen-antibody theory, it suffices to say that in the case reported there was a long incubation or refractory period of six months, which finally ended with a cutaneous display of hypersensitivity (erythematous eruption). Repeated insult to the skin by the continuous use of the perfume finally produced an erythematous eruption, which in forty-eight hours became vesicular (reaction time). A threshold concentration of the perfume, which was qualitative in nature, was necessary to change the clinical picture. Perfume dermatitis, while more complex than that due to butesin picrate, corrosive mercuric chloride and other drugs, consists of the same vital processes and manifests itself according to similar principles of hypersensitivity.

1143 Missouri Theatre Building.

DEATH FOLLOWING COAGULATION OF THE CERVIX

ROBERT I. HILLER, M.D., Milwaukee

From a survey of the literature, one would gain the impression that coagulation and cauterization of the cervix were entirely harmless procedures. Yet I am aware of two deaths following cauterization of the cervix, reports of which have not as yet appeared in the literature. In one of these cases a retroperitoneal phlegmon and in the other a generalized peritonitis were found at autopsy. In 1928 Curtis [1] casually mentioned three cases of pelvic cellulitis from the use of cautery treatment of the endocervix. All of his patients recovered. He felt that this complication was perhaps more common in those women who have a retrodisplacement of the uterus.

The two cases reported here emphasize the fact that coagulation of the cervix is not entirely without danger, especially if there has been a previous history of septic abortion.

REPORT OF CASES

CASE 1.—*History.*—M. R., a white woman, aged 26, a waitress, was seen in consultation, Feb. 12, 1934, complaining of pain in the lower part of the abdomen. Nine days previously she had had a coagulation of the cervix with the Cherry electrode for about forty seconds. Following the coagulation she had experienced mild lower abdominal pains for about seven days. At the end of the seventh day the abdominal symptoms were aggravated and abdominal distention began to develop. She was admitted to the hospital on the following morning with a temperature of 100, pulse of 92, and a respiratory rate of 20. There were no symptoms referable to the urinary, cardiovascular, respiratory or central nervous systems. Except for mild constipation, requiring the regular use of magnesia magma, there were no symptoms of gastro-intestinal disturbances. The patient had begun to menstruate at 13. The periods were always irregular until she was 18. The flow lasted about seven days and was accompanied by dysmenorrhea on the first day. During the past three to four years, the flow had lasted only two or three days. She had been married at 16 and gave birth to a child when she was 18. A few months after the birth of her child, she again became pregnant and had a criminal abortion performed by a midwife. She became extremely ill with chills and fever and pain in the lower part of the abdomen and was confined to bed for several months. Two years before admission she began to have attacks of sharp pain in the left lower quadrant. These came at irregular times and were accompanied by a thick yellowish vaginal discharge, varying in amount but never profuse enough to require the wearing of a napkin. At the age of 22 she was divorced. Her past history was devoid of other significant illnesses, operations or accidents. Measles had been suffered in childhood. Her mother, father and two sisters were all in good health.

Examination.—The blood pressure was 112 systolic, 70 diastolic. The pulse rate was 120. The temperature was 100 F. The respiration rate was 28. The patient was well developed and well nourished. She was acutely ill and pallid. No evidence of a pathologic condition in the lungs was found. The heart was rapid but no murmurs were detected. The abdomen was distended, and marked tenderness and muscle spasm was present over both lower quadrants. On vaginal examination, one could note infiltration in both broad ligaments as well as in the culdesac of Douglas. No bulging was noted at the first examination.

Both Wassermann and Kline tests were negative. The patient was a Moss type II. February 12, the hemoglobin was 93 per cent, the red blood cell count 4,780,000, the color index 0.9 plus, and the white blood cell count 25,600, with 50 segmented and 45 nonsegmented polymorphonuclears, 3 lymphocytes and 2 monocytes. A blood culture taken on February 13 showed no growth after seven days.

Urinalysis, February 13, disclosed an acid, cloudy, dark amber urine with a specific gravity of 1.016, a trace of albumin, and no sugar. A few leukocytes, an occasional granular cast and some squamous epithelial cells were found.

The impression gained was one of acute exacerbation of a chronic pelvic inflammatory disease, probably originating in an old postabortal infection.

Progress.—On the evening of the day of admission to the hospital the patient had a chill, after which her temperature rose to 105.2. This might have been accounted for in part by an intravenous infusion of dextrose and saline solution, which she had obtained at noon. Her temperature thereafter vacillated between 100 and 102.6. Dextrose and saline solution were administered intravenously almost daily and calcium gluconate was administered intramuscularly. The Levine tube was inserted for continuous gastric drainage, February 16, and left in place for two days. February 18, bulging was noted in the posterior vaginal vault and the entire vulva became edematous. Aspiration of the culdesac of Douglas yielded about 6 ounces (180 cc.) of thick gelatinous pus, which on laboratory examination proved to contain gram-positive cocci in short chains—streptococci—gram-positive cocci in groups—staphylococci—and a few gram-negative bacilli. The patient's condition became progressively worse, presenting the characteristic picture of peritonitis, until death occurred, February 19.

CASE 2.—Mrs. G. H. was a well developed white woman, aged 22, who had had a criminal abortion performed a few years previously. She had no children. She could not recall the exact date of the abortion but estimated it to have been about three or four years previous to her present illness. In childhood she had had rheumatic fever, following which a heart murmur developed. Since her abortion she had had pain in the lower part of the abdomen, and on examination her physician had found an erosion of the cervix. He coagulated the cervix with a Cherry electrode, July 9, 1934. July 11 she began to have pain in the abdomen and was seen by me July 12, when she had a temperature of 100.4, pulse of 110, and presented marked tenderness in both lower abdominal quadrants. The rheumatic mitral condition was easily identified by the transverse hypertrophy of the heart and a rough systolic murmur at the apex. She was put to bed in Fowler's position with an ice bag to the lower part of the abdomen and nothing by mouth. By July 14 her temperature had returned to normal and the lower abdominal pain and tenderness had somewhat abated. She made an uneventful recovery.

COMMENT

In both of these cases a history of peritonitis following criminal abortion was present. In one case the abortion had been performed seven years prior to the cervical coagulation, and in the other at least three years. One might well be justified in questioning the possibility of organisms lying dormant in the tissues for such long periods in such a state as to be activated by the inflammatory process occasioned by a cervical coagulation. Curtis [2] expressed himself as follows on this point: "Streptococcus infection of the tubes, as previously stated, is but part of a more widespread pelvic involvement.

1. Curtis, A. H.: Gonococcal Lesions of the Female Genitalia, Am. J. Obst. & Gynec. **16**: 531 (Oct.) 1928.

2. Curtis, A. H.: Chronic Pelvic Infections, Surg., Gynec. & Obst. **42**: 6 (Jan.) 1926.

The complete picture may, however, closely resemble gonorrheal disease. A history of abortion, a persistent tendency to aching distress in the pelvis, a prolonged tendency to slight chills or low grade fever are suggestive. The tissues may yield bacteria for a long period of time: six months is fairly common, recovery of streptococci after two years is not infrequent, in one instance they were obtained eighteen years after the initial infection." The dormant bacteria, however, may possess varying degrees of potential virulence, since in the one case cited a fatal peritonitis resulted, whereas the other patient recovered. These cases further demonstrate that no lasting immunity need result from a previous peritoneal invasion.

CONCLUSIONS

A history of a septic abortion must be considered as a definite contraindication to coagulation treatment of the cervix.

208 East Wisconsin Avenue.

Special Articles

GLANDULAR PHYSIOLOGY AND THERAPY

PREGNANCY TESTS

SELMAR ASCHHEIM, M.D.
Honorary Professor at the University of Berlin, Honorary Corresponding Member of the Royal Society of Medicine, London (Section of Obstetrics); Honorary Fellow of the Edinburgh Obstetrical Society

BERLIN

The old problem of the biologic diagnosis of pregnancy, that is, without physical examination of the woman, has practically been solved by the demonstration of the existence of certain hormones. No hormones are known, however, that appear solely and constantly during pregnancy; there are no specific hormones of pregnancy. Consequently there is no specific hormone pregnancy reaction in the strict sense of the word. In human pregnancy there occurs so great an increase of certain hormones in the blood and so large an excretion of these hormones in the urine that, on the basis of this increased production and excretion, it is possible to diagnose pregnancy with the aid of animal experiments. The basis of the biologic pregnancy test therefore lies in quantitative and not in qualitative hormonic differentiation of the blood or urine of the pregnant woman as contrasted with the blood or urine of the nonpregnant woman. This difference is so exceptionally great that it may be considered the outstanding characteristic of the blood and urine in pregnancy.

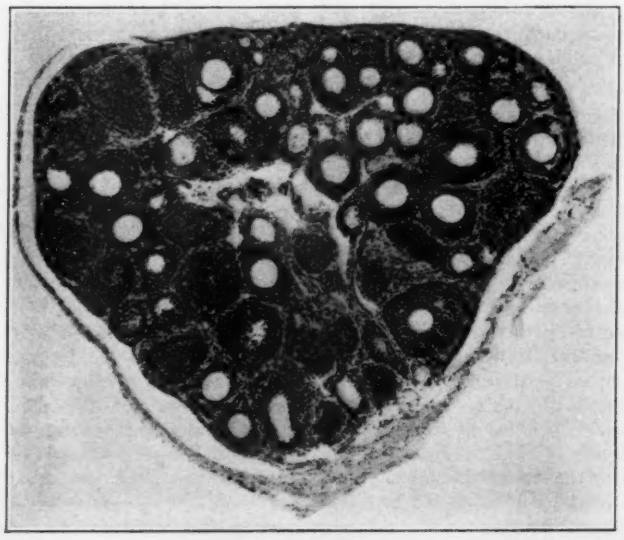

Fig. 1.—Ovary of infantile mouse (normal control). Numerous small follicles; no mature follicles.

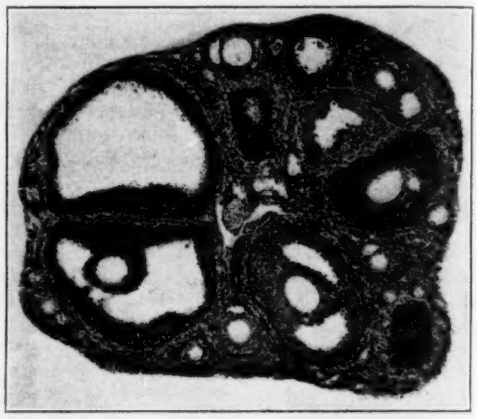

Fig. 2.—Reaction 1 in ovary of infantile mouse: Large follicle with cavity and cumulus oophorus. This reaction is not adequate for the diagnosis of pregnancy.

There are two types of hormones that are definitely increased during pregnancy:

1. The estrus-producing hormone, which may be demonstrated by the Allen-Doisy test in the castrated mouse or rat.

2. The gonadotropic hormone, which is similar in its effects to the gonad-stimulating substance of the anterior lobe of the pituitary; this principle may be demonstrated (1) by the changes in the ovaries that result from its administration to the infantile mouse or rat, (2) by its effects on the endocrine function of the testicles of the infantile mouse or rat, or (3) by the changes produced in the ovaries of the mature rabbit.

The estrogenic substances are described more in detail in the article of Edgar Allen and the gonadotropic factors in the articles by P. E. Smith and by Collip.

During pregnancy the amount of estrogenic substance increases continuously, so that at about the fourth month it may be demonstrated in from 2 to 3 cc. of serum or in 3 cc. of urine by direct injection into test mice. During the latter months of pregnancy the amount of estrus-inducing principle increases markedly, especially in the urine, so that at this stage from 10,000 to 40,000 mouse units may be found in a liter of urine. In practice, biologic diagnosis of pregnancy is especially desired during the first few weeks; for this reason assay of estrogenic substance is not satisfactory for early diagnosis, but it may be an aid to diagnosis in the later months of pregnancy. Of seventy-five assays of urine from pregnant women during the first eight weeks, only seventeen showed a positive Allen-Doisy test with 4 cc. of urine in the castrated mouse, twenty-five gave doubtful results, and thirty-three gave negative results. Furthermore, urine assays of many women afflicted with amenorrhea, some of whom had follicular cysts, gave positive Allen-Doisy tests with 4 cc. of urine in the absence of pregnancy;

In this translation from the German, "gonadotropic substance" is employed as a generic term to indicate the gonad-stimulating principle or principles of pregnancy blood or urine. The question as to whether this consists of one or of two factors has been discussed in the papers by Smith and by Collip. From the practical standpoint of pregnancy tests, this makes little difference.—ED.

thus, assay of the estrus-inducing principle may be considered useless for the diagnosis of pregnancy.

In contrast are the rates of production and excretion of gonadotropic substance. Within a few days after the missed menstrual period it is present in the blood and is excreted in the urine in such amounts that a gonad-stimulating effect is demonstrable in from 1 to 3 cc. of whole urine and even in smaller quantities of this fluid. The pregnancy test that I have developed is based on the assay of gonadotropic substance. The principle of the reaction consists in demonstration of the unusual increase of gonadotropic substance in the organism of the pregnant woman. As this substance is so abundantly excreted in the urine, the test consists in its detection in urine rather than in blood serum; the patient is thus not inconvenienced. The gonadotropic substance produces the same changes in the ovary of the infantile mouse as implantations or extracts of the anterior lobe of the pituitary; as Zondek and I, and P. E. Smith and Engle have demonstrated, a positive Allen-Doisy test may be obtained in from three to four days after the beginning of the experiment. However, estrus is not produced through the presence of estrogenic substance in the anterior hypophysis, as no effect occurs in castrated animals. This phenomenon is mediated by the changes produced in the ovaries of normal animals by an anterior pituitary gonadotropic factor.

In the ovary there appear (1) large mature follicles which on their part produce an estrogenic hormone (estrus is accordingly a secondary effect of the anterior pituitary factor); (2) numerous corpora lutea which either enclose the ovum or result from ruptured follicles; (3) large blood-containing follicles, especially in mice. On the basis of microscopic investigations we differentiate the following three reactions as the characteristic effects of gonadotropic substance on the ovaries of infantile mice:

1. Reaction 1: Follicular maturation, formation of large follicles with secondary estrus (figure 2; compare with figure 1, which represents the normal ovary of an infantile mouse).

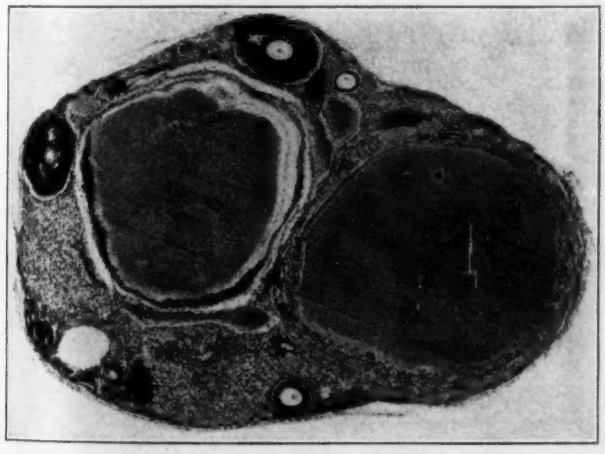

Fig. 3.—Reaction 2 in ovary of an infantile mouse: Hemorrhage in enlarged follicles (blutpunkte). This reaction is used as a pregnancy test.

2. Reaction 2: Hemorrhage in the follicles (German, "blutpunkte") (fig. 3).

3. Reaction 3: Formation of corpora lutea with imprisonment of the ovum (fig. 4).

The appearance of corpora lutea with enclosure of the ovum following administration of an extract of the anterior pituitary was first discovered by Long and Evans. Reaction 1, the formation of mature follicles, presents a physiologic effect; reaction 2 and reaction 3 may be designated as pathologic reactions. Under appropriate experimental conditions certain corpora lutea may appear without enclosure of the ovum, following rupture of mature follicles; that is, the physiologic process of follicular maturation and rupture may be brought about by hormones of the anterior hypophysis.

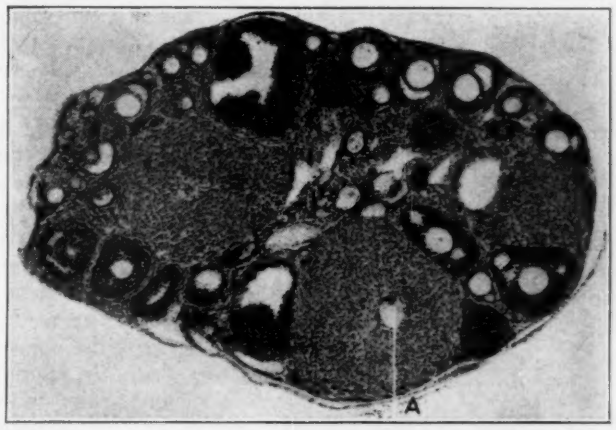

Fig. 4.—Reaction 3 in ovary of infantile mouse: Corpora lutea (3) with enclosure of ovum, *A* (corpora lutea atretica). This reaction is likewise used as a pregnancy test.

The known fact that the anterior lobe of the hypophysis hypertrophies during pregnancy and the generally accepted thesis that this hypertrophy of the anterior lobe is a sign of increased function induced me to investigate whether or not the characteristic principles of the anterior lobe could be demonstrated in the organism of the pregnant woman by means of the aforementioned reactions. I found that implantation of placenta, decidua, corpus luteum of pregnancy and even ovarian cortex of pregnancy produced the same reaction in each case; injection of amniotic fluid or of embryonic extract was similarly effective. Most important of all was the demonstration that the serum of pregnant women contained gonadotropic substance having effects in the infantile mouse similar to those of extracts of the anterior hypophysis. The evidence apparently substantiated the thesis that gonad-stimulating substance appeared in the blood through increased activity of the pituitary itself. It appeared from my discovery, however, that the placenta was very rich in this substance, particularly in the early months of pregnancy, that this organ might also be involved in its production. Later it was found (Philipp) that implantation of the hypophyses of pregnant women into infantile animals had no effect on the ovaries of these animals. It appeared from these studies that the substance which we were able to demonstrate in pregnant women was not of hypophyseal origin but was produced in the placenta. The question is as yet not definitely decided, however; from the practical point of view it is not important for the pregnancy test.

After parturition, gonadotropic substance disappears from the blood stream within three days; at least it cannot be demonstrated after that period in 3 cc. of serum. This fact induced me to investigate what happened to this hormone in the body and whether or not it was excreted in the urine. After I had determined the excretion during the first few days of the puer-

perium I came to the amazing conclusion, on investigating further, that gonadotropic substance is excreted in the urine of pregnant women in such large quantities that even as soon as four or five days following the expected onset of the missed menstrual period a positive reaction could be obtained in infantile mice with from 1 to 3 cc. of urine. It immediately occurred to me that assay of gonadotropic substance in the urine presented a useful test for the diagnosis of pregnancy, and in the large series of investigations that I conducted, originally in collaboration with Zondek, this assumption was completely substantiated.

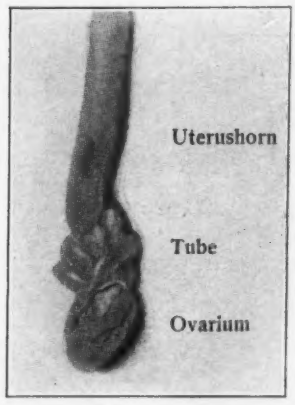

Fig. 5.—Ovary of infantile mouse (normal control) magnified six times.

In these investigations it was soon apparent that the effect designated as reaction 1, that is, the formation of large follicles with a secondary Allen-Doisy reaction, could also be demonstrated with the urine of women beginning the menopause or of those in the advanced climacteric, with the urine of castrated women and with that of women with severe primary or secondary amenorrhea. Women with carcinoma of the uterus were found also to excrete follicular maturation substance, often in great amounts; I now believe, on the basis of recent investigations, that the fact that most of these women were in the menopause is more important than the fact that they were suffering from carcinoma.

Reaction 1 consequently does not serve as a satisfactory criterion of pregnancy. Definite criteria for the diagnosis of pregnancy are reaction 2 (blutpunkte) and reaction 3 (corpora lutea). Reaction 1 must also be evaluated, since occasionally it is the only reaction that occurs in early pregnancy. In such cases the test must be repeated; as far as I was able to determine, in actual pregnancy reactions 2 and 3 always occurred subsequently.

The technic of the reaction proposed by myself, with a few slight modifications of the original method, is as follows: Five infantile mice are used for each test. The animals are weighed at the beginning of the experiment; they should weigh not less than 6 Gm. nor more than 8 Gm. (Animals of this weight, which we procure from dealers in Germany, are usually from 3 to 4 weeks old and show no spontaneous sexual maturation. In other stocks, previous investigation must be made as to the weight of the animals at puberty.) The first urine passed in the morning is injected into the animals subcutaneously, in six doses. Originally, six doses of 0.2 cc., of 0.25 cc., of 0.3 cc. (two animals) and of 0.4 cc. were injected into each of five animals, respectively, during a period of thirty-six hours. For the sake of simplicity this procedure was modified so that six doses of 0.5 cc. are injected into each of five animals, three doses on the first day and three on the second day. (Many urines are quite toxic. Some of these toxic urines, but not all of them, may be detoxicated by shaking them up with ether in accordance with the method proposed by Zondek.) On the fourth and fifth days, vaginal smears are made; ninety-six hours after the beginning of the test the animals are killed and the ovaries examined for corpora lutea and blutpunkte. These may usually be seen with the naked eye but more readily with a lens (figs. 5 and 6). A microscopic examination of the ovaries is seldom necessary. I make such examinations only to establish the occurrence of reaction 1 in case a positive Allen-Doisy test shows a definite hormone effect but the corpora lutea and hemorrhagic spots are not apparent. In such an event the urine is subjected to a second examination.

Positive results sometimes may be obtained as early as sixty hours after the first injection. In this case it is advisable to use several more animals and to kill only half of them at sixty hours. If a positive diagnosis is not made at this time, the result is checked with the remaining animals at ninety-six hours. In emergency cases the Friedman method, which employs mature rabbits, may be used; with this method diagnoses may be made in twenty-four hours.

My own results in 2,000 control urine assays made on women with undisturbed normal pregnancy and on nonpregnant women were as follows:

Urine specimens of normal undisturbed pregnancy, 925.
Positive reactions (2 and 3), 908, or 98 per cent.
Negative reactions, 17, or 2 per cent.

Of these seventeen cases, eleven showed reaction 1. Of these eleven cases, eight gave definite reactions 2 and 3 on the subsequent tests. Urines of the other three patients were not sent to the laboratory for further investigation; hence these could not be examined again. Therefore, false negative reactions were obtained in only six cases, or in 0.65 per cent of the cases of pregnancy.

Urine specimens from definitely nonpregnant women, 1,075.
Negative, 1,070, or 99.5 per cent.
Positive (2 and 3), 5, or 0.5 per cent.
Results: 2,000 urine examinations with twenty-two mistakes, or 1.1 per cent.

False diagnoses, excluding the cases showing reaction 1, amounted to eleven cases, or 0.55 per cent. Seven hundred urine specimens were included that were taken from the fifth to the eighth week of pregnancy, of which the results of the test in fourteen were erroneous (2 per cent). Of these fourteen mistakes, seven were corrected by the second test (namely those which gave reaction 1), so that for early pregnancy practically 99 per cent of the results were correct and 1 per cent erroneous.

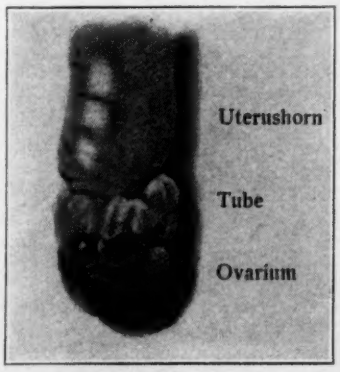

Fig. 6.—Ovary of mouse injected with pregnancy urine: Blutpunkte (4), corpora lutea (2); positive pregnancy reaction (magnified six times).

Later investigators who worked with the original method reported 11,345 urine examinations up to 1933 with 211, or 1.8 per cent, false reports. These results deviate only slightly from my own. The reliability of this reaction, therefore, exceeds by far that of all other biologic pregnancy tests.

Before the application of this method to pathologic cases of pregnancy is discussed it is necessary to con-

sider two questions: 1. How early in pregnancy does the reaction occur? 2. How long does it persist after termination of pregnancy?

1. Several cases have been reported in which a test was made following the coitus resulting in pregnancy in which a positive reaction was obtained before the date of the expected subsequent menstrual period. I have seen reaction 1 in such cases several times. A positive reaction was reported in one case ten days after, in another case fourteen days after, and in a case

Fig. 7.—Ovary of sexually mature virgin rabbit. Large and small follicles are visible, neither follicles containing blood nor corpora lutea are present.

that I observed sixteen days after the coitus resulting in pregnancy. In view of the small number of cases reported it is not possible to state exactly how many days after coitus resulting in pregnancy a positive reaction can first be obtained. Obviously a positive reaction can occur only when the trophoblast has opened the maternal circulation and exchange of material between it and the circulating blood has resulted.

2. With the technic described, gonadotropic substance cannot be detected in the urine beyond seven days after the birth of a full term child. The excretion lasts longer following abortions in the early months of pregnancy, but this varies in individual cases; in general the excretion of gonad-stimulating substance ends by the tenth day, but in some cases positive reactions may be found as late as the sixteenth day. Often before the test becomes completely negative, reaction 1 may be obtained.

Since the reaction depends on exchange of material between the uterine circulation and the chorionic epithelial tissue, it may be concluded in some cases that, when the reaction disappears after having previously been positive, biologic contact between ovum and mother has been interrupted and the ovum has died. A note of warning is necessary here: In cases of clinically verified pregnancy in which the hormone test has been made only once and has been found negative, one may not conclude from this single examination of the urine that the fetus has died, and interruption of pregnancy should never be considered on the basis of a single negative hormone test. In such a case repeated examinations of the urine—also of the blood serum—for gonadotropic and estrogenic substances must be made and all other methods for determining the viability of the fetus (roentgenogram, heart-beat and so on) must confirm the negative hormone tests. Even then most gynecologists will leave expulsion of the dead fetus to nature.

What does the hormone pregnancy reaction offer to the diagnosis of extra-uterine pregnancy? The clinician often speaks of ectopic pregnancy without considering whether it is a matter of living and growing or of dying or dead extra-uterine pregnancy. The biologic reaction informs one primarily as to whether living chorionic epithelial tissue is to be found in the body. From positive reactions in cases clinically diagnosed as extra-uterine pregnancy one may conclude that either an intact and growing extra-uterine pregnancy or a pregnancy in which the fetus has died just recently is present; as in the case of dead intra-uterine pregnancy, gonadotropic substance continues to be excreted for a number of days. An absolutely negative reaction in extra-uterine pregnancy justifies the contention that the fetus no longer lives, that the villi no longer grow, and that the uterine vessels can no longer be eroded. Reaction 1, which is often found in extra-uterine pregnancy, supports the clinical diagnosis of this condition and makes it probable that the pregnancy has just ceased growing; in these cases with reaction 1 on first examination, later no reaction at all is obtained.

I consider it incorrect in statistics on extra-uterine pregnancy to state, for example, that of 100 cases of extra-uterine pregnancy so many cases gave a positive and so many cases a negative result and to conclude from this that the negative results are failures of the reaction. It is necessary to consider the clinical and the anatomic changes, from which it may be determined why, in a number of cases, the biologic reaction is negative or, better said, why it may no longer be positive. In connection with the clinical changes, the hormone test, when it is negative or gives reaction 1, permits a diagnosis of dead or dying ectopic pregnancy. The following is a summary from my own material of results with urine specimens from 122 cases of clinically suspected extra-uterine pregnancy: Of these 122 cases, operative interventions in sixty-six confirmed the diagnosis of extra-uterine pregnancy. Of these sixty-six cases, fifty-three showed reactions 2 and 3 and eight showed reaction 1. In the eight cases a dying extra-uterine fetus was present according to the anatomic observations. Five cases were completely negative; in these the preparations showed the presence

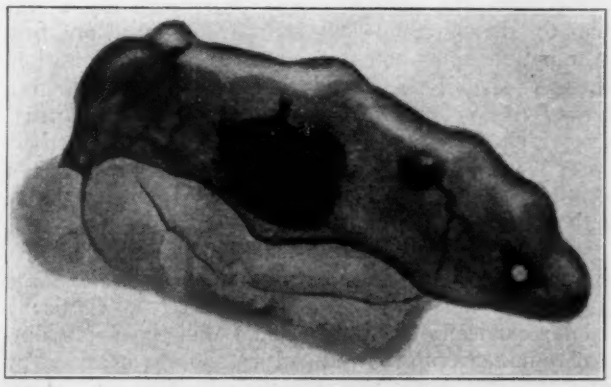

Fig. 8.—Ovary of sexually mature virgin rabbit twenty hours after intravenous injection of 10 cc. of urine from a pregnant woman. Follicles containing blood. Magnified seven times.

of an old tubular mole. In forty-nine cases in which differential diagnosis of extra-uterine pregnancy and tumors of the adnexa were necessary, the reaction was negative. Clinical examinations showed that these were not cases of extra-uterine pregnancy. Of the remaining seven cases, three showed a positive reaction 2 and 3; these were cases of intra-uterine pregnancy. Four showed reaction 1; in one of the latter there was a well founded suspicion that shortly before an abortion had

been performed, and in the three other cases this was similarly suspected but not definitely substantiated.

Professor Wagner has proposed the following valuable method for the differential diagnosis of inflammatory tumors of the adnexa with hemorrhage from the uterus and extra-uterine pregnancy with hemorrhage: The patient is given two injections daily of 1 cc. of posterior pituitary extract. After from five to six days uterine hemorrhage arising from inflammation disappears, while in extra-uterine pregnancy the hemorrhage persists. A combination of this clinical method with the hormone pregnancy reaction provides a high degree of diagnostic accuracy in the differential diagnosis of extra-uterine pregnancy and inflammatory tumors of the adnexa.

In hydatid mole the pregnancy reaction has also proved quite valuable. As the reaction is positive in these cases it was thereby proved that this is independent of the fetus itself and dependent only on the presence of chorionic epithelium. In hydatid mole the quantity of gonadotropic substance produced often shows an exceptional rise. On an average, approximately 25,000 mouse units per liter of urine (urine collected in the morning) is found in the second to the third month of normal pregnancy. In hydatid mole, however, frequently amounts of several hundred thousand units are excreted per liter. The quantity excreted depends on the size of the hydatid mole. In small hydatid moles and in degenerated hydatid moles an increase above that found in pregnancy may not occur at all; indeed, in one case of hydatid mole that had been isolated from the uterine circulation by a fibrinous coating, no gonadotropic reaction could be obtained in the urine from this patient, although the tissue of the hydatid mole itself was effective on implantation (Philipp). If hydatid mole is suspected, quantitative evaluation of the urine should be undertaken. Values of more than 100,000 mouse units per liter point to the presence of hydatid mole with great probability. Such assays, however, do not give absolute surety, for in one case of twin pregnancy 100,000 mouse units per liter was observed. Recently I was able to demonstrate 100,000 mouse units on first examination in a pregnancy of three months' duration, whereas several weeks later a second examination showed a smaller value; at the termination of pregnancy a child was born with normal placenta. Furthermore, it may be said that hormone diagnosis does not permit one to dispense with clinical and physical methods of diagnosis.

In malignant chorionepithelioma the reaction has attained great significance; in this disease, large amounts of hormone are usually excreted. Clinically and histologically the diagnosis of this type of malignant tumor offers great difficulties. Tissue obtained by curettage frequently presents pictures that are highly suggestive but nevertheless cannot be designated by the investigator as definitely malignant. In such cases the biologic reaction is of great value. If it gives a negative result, malignant chorionepithelioma may be ruled out. In positive observations, however, a quantitative evaluation should be made; high hormone values, 100,000 mouse units or more, point to malignant chorionepithelioma. Since the latter frequently occurs after hydatid mole, it should be required that, in every case of hydatid mole, urine examinations should be continued after evacuation of the uterus until the reaction is negative. This may happen after from eight to ten days; indeed, excretion of gonadotropic substance may be found as late as two months afterward without implying the presence of a malignant tumor. It need not be especially emphasized that in the latter cases the most careful clinical observation is necessary and that in hemorrhages immediate curettage is advisable. If the reaction is at first negative and some time later a positive reaction sets in, this points to a malignant change in a hydatid mole, provided of course that pregnancy has not occurred in the meantime. After a chorionepithelioma has been removed, the recurrence of a positive reaction indicates the presence of metastases.

In this connection it is necessary to point out that other tumors with chorionic epithelial constituents also exist and that these give a positive reaction. Such tumors, mainly teratomas, are found in both men and women, especially in the generative glands. The clinician should be aware of this, so that he may not be led to a false diagnosis through a positive pregnancy reaction in one of those unusual cases of ovarian teratoma with chorionepithelioma. Furthermore, it may be mentioned at this point that many diseases of the hypophysis may show positive gonadotropic reactions. Pregnancy ordinarily does not complicate such cases; they are mentioned because they show why this test is not designated a reaction specific for pregnancy.

Of the numerous modifications of the method, such as the use of male infantile animals or the use of adult mice or rats, not one has any special advantage or has been generally employed, with but one exception; that is, the valuable and important method of Friedman (of the United States) in which gonadotropic substance is demonstrated by means of mature female rabbits. The method is based on the fact that, like extracts of the anterior hypophysis, pregnancy urine causes rupture of mature follicles (which are almost constantly present in mature female rabbits) in from sixteen to twenty-four hours. This is therefore a satisfactory and rapid biologic indicator of pregnancy.

The technic has been practiced by most investigators in the following manner: Ten cubic centimeters of urine is injected into an ear vein of a mature female rabbit, which must have been isolated for at least three weeks previously. The ovaries are examined twenty-four hours later. The reaction is positive if the follicular rupture is marked by a reddish protrusion or by recent hemorrhage in the follicles. According to the literature, the reaction has the same reliability as the original method in infantile mice. I employ it when, as in tubular pregnancy, a rapid diagnosis is necessary, and I regard it as a valuable complement to the original method. It is not a complete substitute for the latter, since one cannot determine the occurrence of reaction 1 by the Friedman method. Frequently I have had a negative result with one rabbit while in mice reaction 1 occurred; without the parallel mouse experiments, false negatives would have been reported. In these cases I repeated the urine tests and was able to make the correct diagnosis. In extra-uterine pregnancy, I consider the rabbit reaction of unusual value because with this method many patients can be operated on from two to three days earlier. In case of freshly ruptured extra-uterine pregnancy no biologic reaction is needed, since this type of pregnancy with signs of internal hemorrhage must be brought to operation immediately.

I cannot at this point delve into the question of whether there are one or two gonadotropic substances.

Of the other animals, only the higher apes as, for example, the orang-utan, show this urine reaction. In pregnant mares gonadotropic substance is found in abundant quantities in the blood during the first month of pregnancy, as Cole and Hart (of the United States) have determined. After that time it is no longer demonstrable. The pregnant mare excretes unusually large amounts of estrogenic substance, especially during the second half of pregnancy; this fact has been applied by Küst and Gravert to the diagnosis of pregnancy. This method has also been verified by Crew of Edinburgh and by Zondek.

The discussion presented here is intended to acquaint the practitioner with the nature and reliability of the hormone pregnancy reaction so that he may make use of it in conjunction with clinical observations in the diagnosis of pregnancy.[1]

LEAGUE OF NATIONS INVESTIGATION AND REPORT ON TREATMENT OF EARLY SYPHILIS

BY THE COMMITTEE OF EXPERTS ON SYPHILIS AND COGNATE SUBJECTS, ZURICH, NOV. 21-23, 1934

The Health Organization of the League of Nations publishes[1] the results of an inquiry into the treatment of syphilis carried out in five countries (Denmark, France, Germany, Great Britain and the United States); ninety-three clinics in these countries have contributed to this inquiry and 13,198 case records of primary and secondary syphilis have been analyzed.

Guided by the principles revealed by the study of these records, the experts who have collaborated[2] have adopted the following recommendations, which are of great interest to syphilologists, public health officers and private practitioners:

1. Treatment should be recommended as early as possible in the seronegative primary stage. In this connection, the fullest possible use should be made, for purposes of diagnosis, of the microscopic examination of secretion from primary lesions or from lymph glands.

2. It should be emphasized that, prior to the institution of either of the systems of treatment to be outlined, there should be an adequate physical examination to determine the absence or otherwise of any indication for caution in respect of the dosage.

3. It is essential that, in carrying out the treatment, a strict supervision of the patient be exercised, especially in respect of the mucous membranes, skin, kidneys and liver.

4. Observations, clinical and serologic, after completion of treatment should be adequate and in any case for not less than three years.

5. Adequate examination of the spinal fluid, at least before dismissal from observation, is essential.

6. The principles to be followed in carrying out the actual treatment should be as follows:

(*a*) To employ a comparatively heavy individual dosage of the arsphenamines and of the bismuth or mercurial compounds, the doses being administered in comparatively rapid succession, especially at the commencement.

(*b*) To maintain a persistent attack on the disease, avoiding intervals of such length as to afford the parasite an opportunity of recovering.

(*c*) To administer approximately as much treatment in primary as in secondary cases.

7. The material studied does not enable a clear decision to be made as to the relative merits of intermittent treatment, with courses of injections in rapid succession separated by rest intervals of some weeks, and continuous treatment, or between the simultaneous employment of both arsenical and bismuth or mercury and the system in which bismuth and mercury are withheld until a number of arsenical injections have been administered.

Nevertheless it seems practicable from the results of the analysis and from the personal experience of the experts to formulate a system of intermittent treatment and one of continuous treatment either of which can be expected to yield satisfactory results in ordinary cases of early syphilis.

TABLE 1.—*Plan of Courses of Injections*

Week	Neoarsphenamine, Gm.	or	Arsphenamine, Gm.	and	Insoluble Compound of Bismuth Containing Bismuth Metal,* Gm.
1st	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
2d	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
3d	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
4th	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
5th	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
6th	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
7th	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
8th	0.6 to 0.75	or	0.4 to 0.5	and	0.20 to 0.24
9th	.....		.....		0.20 to 0.24
10th	.....		.....		0.20 to 0.24

* By insoluble bismuth is here meant compounds of a very slight solubility in water. They should therefore be given in suspension, those of extremely slight solubility (the oxychloride, etc.) usually in a watery suspension, those that are more soluble (the subsalicylate, quinine bismuth iodide, the alkaline tartrates, etc.) suspended in a vegetable oil. If a liposoluble compound (e. g., the camphocarboxylate, etc.) is preferred, it is desirable that the injection be given twice weekly in half doses.

The dosage of all bismuth compounds should be calculated according to their content in bismuth metal.

As an alternative to bismuth, a course of mercury may be given, either in the form of inunctions (40 days at 3 Gm. of unguentum hydrargyri) or of injections (70 mg. of mild mercurous chloride or 120 milligrams of mercuric salicylate, etc., suspended in a suitable base).

It seems possible that the intermittent treatment that is suggested may in effect be continuous or practically continuous treatment owing to the continued absorption of bismuth from the sites of the injection for some weeks after any temporary suspension of the treatment.

PLAN OF INTERMITTENT TREATMENT

For adult males of average weight less than 50 years of age and in whom there is no contraindication, a number of courses of injections on the plan described. It should be said that, at the beginning of this course, some administer at once the full weekly dose (from 0.60 to 0.75 Gm.), while others divide it into two doses (e. g., 0.30 and 0.45 Gm.) so far as the first week is concerned.

1. Further discussion of this subject may be found in:
Aschheim, Selmar: Schwangerschaftsdiagnose aus dem Harn, ed. 2, Berlin, S. Karger, 1933.
Clauberg: Die biologische Frühdiagnose der Schwangerschaft (AZR), Review in Ber. ü. d. ges. Gynäk. u. Geburtsh. **25**, No. 4/5, 1933.
Engle, E. T., in Allen, Edgar: Sex and Internal Secretions, Baltimore, Williams & Wilkins Company, 1932, chapter XVI.

1. Quarterly Bulletin of the Health Organisation **4**, March 1935.

2. Prof. J. Jadassohn, former director of the dermatologic clinic of the University of Breslau. Col. L. W. Harrison, technical adviser in venereal diseases, Ministry of Health, London. Prof. T. Madsen, director of the state serotherapeutic institute, Copenhagen. Prof. Louis Queyrat, president of the Ligue nationale française contre le péril vénérien. Professor Queyrat died and was succeeded by Prof. H. Gougerot, director of the Clinique des maladies cutanées et syphilitiques de la Faculté de médecine de Paris (Hôpital St. Louis). Prof. C. Rasch, director of the State Hospital, Copenhagen, whose place was occasionally taken by Dr. Svend Lomholt, director of the dermatologic clinic of Finsens Lysinstitut, Copenhagen. Dr. John H. Stokes, professor of dermatology and syphilology, University of Pennsylvania School of Medicine, Philadelphia. Rapporteur, consultant in venereal diseases, United States Public Health Service. Prof. Hans Martenstein, director of the dermatologic clinic, Municipal Hospital, Dresden-Friedrichstadt.

It is recommended that:

(*a*) In cases which remain or become serologically negative during, or by the end of, the first course four such courses be administered, with intervals of three to five weeks between any two courses.

(*b*) In cases which have not become seronegative by the end of the first course, in addition to the amount of treatment shown in *a*, further courses should be administered until the patient has received as a minimum three beyond that which has ended with negative serum reactions. At the option of the individual clinician, this treatment may be prolonged as may be considered necessary.

and the arsenical, believed by some observers to protect against neurorelapses, one should begin the bismuth treatment two, three or even four injections before the end of the longer arsenical course and continue it through the period in which the arsenical is suspended and on into the beginning of the next arsenical course. The bismuth treatment is then suspended while the arsenical course is completed.

The bismuth salt advised for this system is bismuth salicylate in oil suspension, in full adult dosage with due regard for weight. Other preparations of bismuth may be used only with due regard for an equivalent metallic content and for their rate of elimination. The

TABLE 2.—*Plan of Alternating Continuous Treatment for Early Syphilis*

Time	Arsphenamine, Gm.	Interim Treatment	Serologic Test	Comment
Day				
1	0.3-0.6	.....	1	Arsphenamine dosage for first 3 injections at level of 0.1 Gm. for each 25 pounds (11.3 Kg.) body weight. Average subsequent dosage, 0.4 Gm. men, 0.3 Gm. women, the 4th and subsequent injections in the first course at weekly intervals. In average patient, all lesions heal rapidly and blood serologic reaction becomes negative during first course. If arsphenamine cannot be used, substitute 8 to 10 doses of 0.3 Gm. of silver arsphenamine or 10-12 doses of neoarsphenamine (0.45-0.6 Gm. maximum for women and 0.6-0.75 Gm. for men). This applies also to subsequent courses
5	0.3-0.6			
10	0.3-0.6			
Week				
3	0.4			
4	0.4			
5	0.4			
6	0.4			
7	0.4	.....	1	If mercury is used, note overlap of 1 week at end of first and start of second arsphenamine courses. At this point a few days without treatment may be dangerous. (Neurorelapse)
8	...	Bismuth compounds, 4 doses 0.2 Gm. and potassium iodide or mercurial ointment and potassium iodide		
9				
10				
11				
12	0.4	.....	1	Arsphenamine starts, bismuth compounds stop
13	0.4	.....	1	Watch for provocative serologic reaction after first dose of arsphenamine
14	0.4	.....	...	Try to prevent short lapses in treatment, especially at this early stage
15	0.4			
16	0.4			
17	0.4	.....	1	
18-23	...	Bismuth compounds, 6 doses or mercurial ointment and potassium iodide	...	Bismuth compounds are better than mercury; use if possible. Examine cerebrospinal fluid if patient's cooperation can be secured at about this time. If found to be abnormal, continue or intensify treatment as required, reexamining fluid within 6 months
24	0.4			
25	0.4			
26	0.4			
27	0.4			
28	0.4			
29	0.4			
30-37	...	Bismuth compounds, 8 doses or mercury and potassium iodide		
38	0.4	.....	1	
39	0.4			
40	0.4			
41	0.4			
42	0.4			
43	0.4	.....	1	
44-53	...	Bismuth compounds, 10 doses or mercurial ointment and potassium iodide	...	Note that bismuth or mercury courses are gradually getting longer: 4, 6, 8 and now 10 weeks
54	0.4	.....	1	
55	0.4	.....	...	The average seronegative, seropositive primary or early secondary patient should have at least 5 courses of arsphenamine
56	0.4			
57	0.4			
58	0.4			
59	0.4	.....	1	
60-69	...	Bismuth compounds, 10 doses or mercurial ointment and potassium iodide	...	It is safer to finish treatment with bismuth or mercury compounds rather than with arsphenamine
70-122	Probation.	No treatment.....	6-12	
123	Complete physical and neurologic examination, lumbar puncture, and, if possible, fluoroscopic examination of heart and great vessels			

(*c*) Cases presenting signs of clinical relapse of an early type should be dealt with on principles similar to those enunciated in *b*.

For nonpregnant females, treatment should be administered on the plan outlined for men, with the exception that the single dose of neoarsphenamine should be reduced by 0.15 Gm. and that of arsphenamine by 0.1 Gm.

In the event of any reduction in the amount of treatment being indicated, it is recommended that this be effected by reducing the number of arsenical injections rather than by reducing the individual dose or increasing the intervals.

As an optional scheme more in harmony with the trend toward longer courses, three series of from ten to twelve injections each of the arsenical drugs may be given. To secure an overlapping of the heavy metal mercurial inunction is 50 per cent metallic mercury in a suitable fatty base, the dose being 4 Gm. by inunction, from five to six inunctions each week. The use of the iodide is optional, depending on indications.

The use of insoluble mercurials intramuscularly in this system is not recommended.

It should be further understood that when heavy metal is employed after the last course of arsphenamine the heavy metal courses are to be separated by rest intervals of from six to eight weeks after each series of ten weeks injections, or each course of forty inunctions.

In cases of primary syphilis that have remained seronegative throughout, a minimum of five courses of arsphenamine or neoarsphenamine should be given. In cases of seropositive primary syphilis, the full treatment called for by this system should be given.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

WARRANTY SIEVED BEETS

Manufacturer.—The Nielsen Corporation, Ltd., Oakland, Calif.

Description.—Sieved beets prepared by efficient methods for retention in high degree of the natural mineral and vitamin values. No added sugar or salt.

Manufacture.—The beets as received from the field are cooked in steam to loosen the skins, which are removed by hand. Any necessary trimming is done at the same time. After a final rinse, the beets are cut and ground and subsequently processed and canned by essentially the same procedure as described for Warranty Sieved Spinach (THE JOURNAL, Feb. 2, 1935, p. 399).

Analysis (submitted by manufacturer).—

	per cent
Moisture	87.8
Total solids	12.2
Ash	0.8
Sodium chloride	0.05
Fat (ether extract)	0.02
Protein (N × 6.25)	1.3
Reducing sugars as invert sugar	0.6
Sucrose	6.5
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	9.5

Calories.—0.4 per gram; 11 per ounce.

Vitamins.—The method of preparation and processing insures the retention in high degree of the natural vitamin values.

Claims of Manufacturer.—Specially intended for infants, children and convalescents, and for special smooth diets. Only warming is required for serving.

SPECIAL DRYCO

Manufacturer.—The Dry Milk Company, Inc., New York.

Description.—Drum dried irradiated partially defatted milk (Dryco) fortified with vitamin B concentrate prepared from rice polish. Contains from 100 to 125 Sherman vitamin B units per ounce.

Manufacture.—Rice "polish" is extracted with moderately warm water. Insoluble matter is mechanically separated out of the filtrate. The almost clear filtrate is dried and stored either in air tight containers or hermetically sealed containers filled with inert gas, or is concentrated to a viscous syrup and stored at a low temperature (—20 C.). The vitamin B concentrate, either in dry or in syrup form, is added to the irradiated fluid milk prepared as previously described for Dryco (THE JOURNAL, Jan. 2, 1932, p. 49) in the proportions of 3.5 parts of solids of the rice polish extract to 96.5 parts of milk solids. The mixture is dried by the Just process, as previously described for Dryco, and hermetically sealed in cans in the presence of nitrogen gas.

Analysis (submitted by manufacturer).—

	per cent
Moisture	3.1
Ash	7.0
Fat (ether extract)	11.6
Protein (N × 6.25)	31.5
Carbohydrates (by difference)	46.8

Calories.—4.2 per gram; 119 per ounce.

Vitamins.—Contains from 100 to 125 Sherman vitamin B units and from 37 to 52 U. S. P. vitamin D units per ounce. Taken as a daily ration, it prevents rickets.

Claims of Manufacturer.—Especially recommended for infants deprived of mother's milk and for convalescents.

(1) HAWAIIAN CROSS BRAND HAWIIAN PINEAPPLE FANCY CRUSHED
KING OF HAWAII HAWAIIAN PINEAPPLE (FANCY QUALITY) CRUSHED
HAWAIIAN CRUSHED PINEAPPLE (FANCY QUALITY)
(2) HAWAIIAN CROSS BRAND HAWAIIAN PINEAPPLE (FANCY) CRUSHED IN JUICE
KING OF HAWAII HAWAIIAN PINEAPPLE (FANCY QUALITY) CRUSHED IN JUICE
(3) HAWAIIAN STAR CRUSHED PINEAPPLE (STANDARD QUALITY)
SURE HIT BRAND CRUSHED HAWAIIAN PINEAPPLE (STANDARD QUALITY)

Distributor.—Alexander & Baldwin, Ltd., Honolulu, Hawaii.

Packers.—Kauai Pineapple Company, Kalaheo, Kauai; Baldwin Packers, Ltd., Lahaina, Maui; and the Maui Pineapple Company, Kahului, Maui (subsidiaries).

Description.—(1) and (3) Grades of crushed pineapple packed in pineapple juice with added sucrose. (2) Crushed pineapple packed in pineapple juice without added sucrose.

Manufacture.—Crushed pineapple obtained by shaving off the flesh adhering to the skins or by the mechanical cutting of broken slices is cooked in steam jacketed kettles with or without the addition of sucrose, and is canned and processed. The distinction between the grades is that of added sucrose only.

Analyses (submitted by distributor).—

(1) *Fancy finest quality (sugar added).*—

	per cent
Moisture	74.8
Ash	0.4
Fat (ether extract)	0.1
Protein (N × 6.25)	0.5
Reducing sugar as invert sugar	21.1
Sucrose	0.4
Crude fiber	0.4
Carbohydrates other than crude fiber (by difference)	22.7
Titratable acidity as citric acid	1.1

(2) *Fancy finest quality.*—

	per cent
Moisture	84.9
Ash	0.4
Fat (ether extract)	0.1
Protein (N × 6.25)	0.5
Reducing sugar as invert sugar	11.2
Sucrose	0.1
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	12.6
Titratable acidity as citric acid	0.9

(3) *Standard quality (sugar added).*—

	per cent
Moisture	78.2
Ash	0.4
Fat (ether extract)	0.1
Protein (N × 6.25)	0.4
Reducing sugar as invert sugar	17.3
Sucrose	0.2
Crude fiber	0.4
Carbohydrates other than crude fiber (by difference)	19.5
Titratable acidity as citric acid	1.0

Calories.—

Fancy finest quality in syrup: 1.0 per gram; 28 per ounce.
Fancy finest quality in juice: 0.6 per gram; 17 per ounce.
Standard quality in syrup: 0.8 per gram; 23 per ounce.

Vitamins.—Biologic assay shows the products to be a good source of vitamins A, B and C containing only slightly less than fresh pineapple.

HERCULES JUSTRITE BRAND GELATIN
TITAN JUSTRITE BRAND GELATIN

Distributor.—Meyer-Blanke Company, St. Louis.

Packer.—Atlantic Gelatin Company, Inc., Woburn, Mass.

Description.—Granular and flake plain unsweetened, unflavored gelatins; graded on the basis of jelly strength for special uses; the same as Atlantic Super-Clarified Gelatin (THE JOURNAL, Feb. 18, 1933, p. 499).

RIVAL UNSWEETENED EVAPORATED MILK

Distributor.—Rival Foods, Inc., Cambridge, Mass.

Packer.—Sheffield Condensed Milk Company, New York.

Description.—Canned, unsweetened sterilized evaporated milk, the same as Sheffield "Sealect" Brand Unsweetened Evaporated Milk (THE JOURNAL, Feb. 3, 1934, p. 373).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - - Seven dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, APRIL 13, 1935

FOOD POISONING

Food poisoning has recently become the object of much discussion and experimental investigation. This increased interest may be the result of a newly awakened consciousness that many mild intestinal upsets are due to some toxic bacterial substance. Interest has been stimulated and knowledge increased especially by the work of E. O. Jordan, a pioneer in the field. Food poisoning, in the sense used here, is characterized by diarrhea, nausea, abdominal pains and sometimes fever, which result from the ingestion of foods contaminated with bacteria or their products. The onset is from two to twenty-four or thirty-six hours after eating, and the attacks vary in severity. Usually they are not of long duration and recovery is complete. Botulism, of course, has a distinct and different clinical syndrome; the primary symptoms are great muscular weakness, no fever, profuse secretions from both the mouth and the nose, and often disorders of the eyes. Botulism is not difficult to diagnose and the mortality is high. It is the result of the ingestion of a true toxin from food contaminated with Clostridium botulinum. Patients show symptoms of a profound systemic toxemia rather than the gastro-enteric irritation characteristic of the food poisoning under consideration. The cases of so-called ptomaine poisoning are in all probability forms of food poisoning due to toxic substances other than ptomaines.

For many years, members of the Salmonella group have been regarded as the most important agents of acute food poisoning other than botulism. Recently, however, Jordan's work [1] has brought proof that other bacteria are implicated. Progress with this investigation has been retarded by the nature of the problem. Often the causative agent must be sought in a remote bakery, canning company or other food concern. The only clue available for the investigator is what he sees in those affected. By a process of selection and elimination he determines what food from a common source the patients have consumed. Not infrequently the contamination may occur in bakeries, bacteria having been isolated from fillings for cakes and pies. Staphylococci, and more particularly Staphylococcus aureus, have been isolated as the active agents in a number of outbreaks. Occasionally streptococci also have been found. The symptoms in these cases vary to some extent from those of Salmonella poisoning. The incubation period is shorter and, while the symptoms are acute and sometimes alarming, the mortality is low.

The toxic substance causing certain food poisonings is a product of bacterial metabolism. The first successful experiments to establish this fact are described by Dack,[2] who fed bacteria-free filtrates of staphylococcus cultures to human volunteers and obtained symptoms of typical food poisoning. Jordan and McBroom [3] in 1932 made successful experiments in several species of juvenile South American monkeys. They fed the animals approximately 50 cc. of a filtrate of cultures of staphylococci isolated from patients with food poisoning. Diarrhea, loss of appetite and abdominal distress developed. Of thirteen animals infected, definite symptoms were obtained in five. A possible explanation of this small number of takes has been proffered by Borthwick,[4] who states that the p_H has a definite and strong effect on the active principle in toxic filtrates of staphylococcus cultures, the toxicity being destroyed or markedly decreased at a p_H higher than 7.8 or lower than 6.8. He succeeded in producing symptoms in guinea-pigs without exception by adjusting the stomach reaction to a p_H favorable for the action of the poison (7.3) before feeding staphylococcus filtrates to the animals. Differences of the p_H of the stomach contents may afford an explanation, then, for the variable results in attempts to reproduce the symptoms in animals.

Staphylococcus products are not the only substances to be considered in food poisoning. In a recent epidemic in Winona a green-producing steptococcus was isolated as the causative agent.[5] Twenty-five cubic centimeters of a sterile filtrate of a culture of this organism, when fed to monkeys, caused symptoms identical with those caused by staphylococcus filtrates.[6] The chemical nature of the toxic substance has not yet been clearly defined nor has it been demonstrated to be a true toxin. It appears to be similar in staphylococcus and streptococcus filtrates and is not limited to strains obtained in cases of food poisoning. Filtrates from streptococcus cultures of both alpha and beta types and from different origins are capable of causing food poisoning. Indeed, the presence of this poison may account for the gastro-intestinal symptoms in scar-

1. Jordan, E. O.: Staphylococcus Food Poisoning, J. A. M. A. **97**: 1704 (Dec. 5) 1931.

2. Dack, G. M.; Cary, W. E.; Woolpert, Oram, and Wiggers, Hazel: Food Poisoning Due to a Staphylococcus, J. Prev. Med. **4**: 167 (March) 1930.

3. Jordan, E. O., and McBroom, Josephine: Results of Feeding Staphylococcus Filtrates to Monkeys, Proc. Soc. Exper. Biol. & Med. **29**: 161 (Nov.) 1931.

4. Borthwick, G. R.: Experimental Observations on Toxic Effects of Staphylococcal Filtrates, Brit. J. Exper. Path. **14**: 236 (Aug.) 1933.

5. Jordan, E. O., and Burrows, William: Streptococcus Food Poisoning, J. Infect. Dis. **55**: 365, 1934.

6. Woolpert, O. C., and Dack, G. M.: Relation of Gastro-Intestinal Poison to Other Toxic Substances Produced by Staphylococci, J. Infect. Dis. **52**: 6 (Jan.-Feb.) 1933.

let fever and other streptococcic infections.[7] Further investigation is necessary to ascertain the exact chemical nature of the toxic substance. It is extracted by ether,[8] is unstable when heated with hundredth normal hydrochloric acid, does not produce a positive skin reaction, and its effect is destroyed after cultivation of the organism for several generations on artificial mediums.

A knowledge of food poisoning is of importance to the student of public health and to physicians. An accurate recognition of symptoms and prompt report of cases will be of great value in the control of outbreaks. These recent investigations have advanced knowledge of food poisoning and are paving the way to the ultimate control and eventual elimination of the disease.

WATER TRANSMISSION OF AMEBIASIS

Evidence that amebiasis may be water borne has recently become highly suggestive. As a result of the outbreak of amebic dysentery in Chicago in 1933, cross connections between water and sewer lines and defective piping have been, as pointed out by Magath [1] and others, the source of surprising discoveries. Thus, as he says, direct and indirect cross connections between sewerage and water lines is so common that one might say it is universal. The existence of this situation, and the belief that massive doses of amebas are usually necessary for the development of human acute amebic infection, strongly suggest the water spread of most acute amebiasis.

Further evidence of water-borne amebiasis is offered in the recent report by Hardy and Spector.[2] Following an extensive fire in Chicago in May 1934, many cases of acute diarrhea appeared followed in due time by typhoid. These occurred in both firemen and spectators. As a result, a careful study of the water system in the fire area was undertaken. A double water supply, partly from private sources and partly municipal, was discovered. Moreover, open cross connections allowing the mixture of heavily polluted water with the city supply were later disclosed. It was thus apparent that most firemen as well as spectators in the immediate neighborhood of the fire were exposed to heavy pollution of their drinking water.

On the third and fourth days after the fire, acute enteritis among firemen was reported. That amebic dysentery might also be present seemed a distinct possibility and hence a special study was instituted. Classic cases were not, however, encountered among firemen. The early onset and course was not that of amebic dysentery, but later clinical and laboratory observations demanded its consideration. This evidence may be summarized as follows: Endamoeba histolytica was present in almost two thirds on one stool examination only. Bacteriologic studies failed to reveal other etiologic agents. Treatment with carbarsone was found to be remarkably effective. The late symptoms and course of the illnesses were quite characteristic of amebic infections. The authors therefore believe that Endamoeba histolytica was the important etiologic agent in the group with the more severe infections.

The investigation of firemen was paralleled by careful observations in all cases of amebic dysentery reported to the Chicago board of health. Routine information as to possible exposure at the stockyards fire was requested. Eleven cases apparently from this source were discovered. In five of these the laboratory examination pointed tc a diagnosis of amebic dysentery, but on clinical grounds the illnesses could not be differentiated from nonspecific enteritis. The remaining cases were of unquestionable amebic origin.

The authors believe that these studies provide definite evidence that amebic dysentery may be water borne. Undoubtedly a large number of amebic infections resulted from drinking polluted water at the fire. There were, however, few cases of classic amebic dysentery. The explanation for this apparent paradox, they feel, lies in the probable association of acute nonspecific enteritis due to massive sewage ingestion with Endamoeba histolytica infestation.

OAKLAND COUNTY, MICH., MEDICAL EMERGENCY RELIEF

The cooperation of physicians, dentists, nurses and druggists in the County Emergency Welfare Administration in Oakland County, Mich., has resulted in a system of medical care for relief clients so comprehensive and satisfactory to all served that its description may be helpful to other localities. The plan is based on a faithful adherence to the intent as well as to the wording of FERA Rules and Regulations No. 7, in the preparation of which, it will be remembered, the American Medical Association participated. A "medical manual" has been issued, containing a description of the plan, all the blanks used, and standard instructions for all those concerned. In the introduction the medical director states that "the reason why we feel that this plan is successful thus far is the utter lack or absence of complaints from the welfare clients, and the universal approval of physicians and dentists."

Among the principles set forth as necessary to "be considered before any medical plan will function properly" are free choice of physician, cooperation of the county medical society, prompt payment for services rendered, no dictation of methods of treatment by lay-

7. Scamman, C. L.; Lombard, H. L.; Beckler, E. A., and Lawson, G. M.: Scarlet Fever Outbreak Due to Infected Food, Am. J. Pub. Health **17**: 311 (April) 1927.

8. Jordan, E. O., and Burrows, William: Nature of the Substance Causing Staphylococcus Food Poisoning, Proc. Soc. Exper. Biol. & Med. **30**: 448 (Jan.) 1933.

1. Magath, T. B.: The Water Transmission of Infections, with Especial Reference to Amebiasis, J. Am. Water Works A. **27**: 63 (Jan.) 1935.

2. Hardy, A. V., and Spector, Bertha Kaplan: The Occurrence of Infestations with E. Histolytica Associated with Water-Borne Epidemic Diseases, Pub. Health Rep. **50**: 323 (March 8) 1935.

men, and a medical advisory committee that can and will discipline the members of the profession more effectively than others outside the profession.

A characteristic of this plan, which is a deviation from the practice common elsewhere in emergency relief, is that any person who presents to any physician a card stating that he is on relief is immediately given the medical care needed. The physician reports the service furnished within seven days and receives payment usually within thirty days. This procedure places more responsibility on the physician and secures quicker action than when medical service must always follow a social service investigation. It also does away with any possible influence by a social service worker in the selection of a physician.

The spirit of the understanding is expressed in the statement that "social problems are one thing and medical problems another, and it would seem that by tending strictly to their own field both groups would be fairly well occupied during such times as these."

The medical work is under the direct supervision of a medical director who is a physician. It is made clear that the medical director "should serve in an administrative capacity entirely. It should not be his duty to dictate what diagnosis is made by the family physician or to criticize in any manner the type of treatment without first consulting the advisory committee appointed by the county medical society. In other words, he should refrain from medical dictatorship."

All disputes as to medical matters go before the medical advisory committee of the county medical society. There are special regulations to prevent imposition by clients who demand excessive medical service.

The fee schedule, which "is intended as a guide only," is about one half of the minimum fees usually charged in the community. All drugs must be prescribed by the physician and must be taken from the U. S. P. or N. F. unless special authorization is granted. Except in case of emergency, serious operations require consultation and special authorization. The arrangements as to dental care are practically the same as those for medical service. Nursing, surgical appliances, glasses, special diets and other things considered necessary by the attending physician are provided, also after special authorization.

The cost of the plan has been less than under previous methods of giving relief. In 1934 a total "gross case load" of 15,548 families was given medical care. This case load varied from 5,983 in June to 10,566 in December. The average cost for medical service for 1934 per family per month was $0.9523 and the average cost per person was $0.2506. The total payments to physicians for the year were $89,729.74 and the total cost for all kinds of medical, dental, nursing and other service, excluding drugs and glasses, for which the audit is not yet complete, was $116,881.06. Laboratory service was furnished by the county hospital without charge. A letter signed by the board of directors of the Oakland County Medical Society says "We feel that the administration of medical poor relief in Oakland County has come as close to approximating the ideal as it is possible to come in the first year of any program."

Current Comment

YELLOW FEVER

Public Health Reports, issued weekly by the United States Public Health Service, contains current information regarding the prevalence and geographic distribution of communicable diseases in the United States as far as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever and other important communicable diseases throughout the world. An excellent summary of the occurrence of yellow fever and the recent advances in knowledge relating to this disease [1] has just been made available. The incidence of yellow fever in Colombia and in West Africa is discussed, and the present status of this disease in the Americas is outlined. Although yellow fever is no longer a problem as a communicable disease in the United States, the report serves to emphasize the sporadic outbreaks that have occurred in other countries within the immediate past. Protection tests, transmission of protective qualities to offspring, dengue, vaccination and immunization are other topics considered in this report.

INHERITANCE OF PIGMENTATION

The question is constantly asked whether or not parents who are light in color, that is, one of whom has a small amount of Negro blood, may give birth to a coal-black child. Indeed, newspaper stories of the birth of a black child to white parents whose ancestry shows a slight trace of Negro blood several generations back appear with amazing frequency. The question is also asked whether or not pure Negro children may be born to mulatto parents who occasionally pass as white. The answer is of course in the negative. The entire subject was analyzed by Irene Barnes,[1] who was concerned particularly with the question whether or not the crossing of persons of different color results in a blend of pigmentation. In making her study, a technic for measurement of pigmentation was worked out and the previous literature on the subject was analyzed. Studies were then made on a considerable number of Negroes and the data obtained were compared with those available from previous studies. The conclusions were reached that the offspring of parents of different color tend to resemble the parent with the greater percentage of dark pigmentary supply more than they tend to resemble the parent with the less percentage. However, pigmentation is not inherited by blending nor is

1. Yellow Fever, Pub. Health Rep. **50**: 369 (March) 1935.

1. Barnes, Irene: The Inheritance of Pigmentation in the American Negro, Human Biology **1**: 321 (Sept.) 1929.

it produced by the action of one or two factors that act as mendelian dominants. The studies made by the Davenports indicate that two nearly white hybrid parents can have offspring somewhat darker than themselves but that it is not genetically possible for nonhybrid parents to have Negro children unless a melanic mutation should occur. There is no evidence that such mutations do occur, and the appearance of a Negro child from a white parent naturally has a much simpler explanation.

Medical Economics

INFLUENCE OF SICKNESS INSURANCE ON DIPHTHERIA MORBIDITY AND MORTALITY

Diphtheria morbidity and mortality rates seem to offer a fairly sound test of the quality of medical service received by a community. The conquest of diphtheria is now in process. The methods of achieving victory are known. The date of complete triumph depends on the way in which these methods are applied to the entire population. Diphtheria death rates vary directly with the extent to which these known and tested methods of prevention and treatment are made available to the population. This situation furnishes conditions, almost laboratory in type, from which to determine the social value of a medical service.

The arguments for sickness insurance may be summed up in the claim that it removes the economic obstacles to the giving of medical service and thereby secures a wider and more effective distribution of that service. Because of the interest in the progress of this conquest of diphtheria, statistics have been gathered throughout most modern nations.

TABLE 2.—*Population According to Latest Available Information*

Germany	(1933)	65,913,082
England and Wales	(1931)	39,947,931
Austria	(1933, estimated)	6,739,524
Belgium	(1933, estimated)	8,213,449
Denmark	(1933, estimated)	3,623,000
Scotland	(1931)	4,842,554
Norway	(1933, estimated)	2,845,000
Poland	(1934)	33,000,000
Sweden	(1933, estimated)	6,190,364
Czechoslovakia	(1931)	14,726,158
Canada	(1931)	10,376,786
United States	(1934, estimated)	126,654,000

The League of Nations has assembled the reported diphtheria cases from 1923 to 1933 for a number of countries. These are given in table 1.

The population of these countries, according to the latest available information, is given in table 2. It is at once evident from this table that variations in the number of cases between countries or in time within any country bear no relation whatever to the existence of insurance, unless it is a negative relation. The number of cases has increased in Germany and Austria, where the insurance system extends to the family, and also in England and Wales, where families are not included. The number of cases has declined most rapidly in Canada and the United States, where there is no sickness insurance.

TABLE 3.—*Diphtheria Mortality per Hundred Thousand of Population in Groups of Large Cities*

	1928	1929	1930	1931	1932	1933
51 German towns*	8.4	10.6	11.7	7.1	5.6	8.0
118 English towns*	9.7	9.4	10.2	7.7	6.9	8.2
16 Scottish towns*	12.2	11.5	11.5	8.5	8.6	7.2
88 U. S. cities†	9.2	7.8	5.1	3.7	3.2	2.3
28 U. S. states‡	...	6.4	4.6	4.1	3.8	2.9

* Epidemiological Report of the Health Section of the Secretariat of the League of Nations, March-April 1934, p. 52.
† THE JOURNAL, May 26, 1934, p. 1760.
‡ Public Health Reports, May 4, 1934.

Promptness of treatment with immediate application of recognized remedies determines the mortality. The statistics on mortality are available only in a somewhat different form from those on morbidity. These statistics are given in table 3.

Again it is noted that the rate of decline in mortality is more rapid in the English and Scottish towns, where children are not included in the insurance system, than in Germany, where they are included. But the most striking fact is that in neither of these countries has the decline been as rapid as in the United States, with no insurance. These figures for the United States, however, do not tell the whole story. This country and Canada, unencumbered by insurance, are the only ones in which there seems to be a possibility of complete victory. In 1933 the following eleven cities of considerable size had no diphtheria deaths: Duluth, Elizabeth, Hartford, Rochester, Salt Lake City, Seattle, South Bend, Spokane, Springfield, Syracuse, Yonkers. Some of the very largest cities in the United States had death rates much less than even the low average. Some of these and their death rates per hundred thousand in 1933 were as follows: Philadelphia, 0.7; New York, 1.2; Baltimore, 0.7; Chicago, 0.2; Milwaukee, 0.8; Omaha, 0.9; St. Paul, 1.1; Minneapolis, 1.4; Oakland, 0.7; San Francisco, 1.2.

TABLE 1.—*Diphtheria Cases Reported in Certain Countries from 1923 to 1933* *

	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933
Europe:											
Germany	31,942	37,248	37,767	30,299	33,890	46,905	50,536	70,552	57,822	64,138	74,559
England and Wales	40,009	41,980	47,720	51,069	52,011	61,134	62,840	74,043	50,290	43,399	47,454
Austria	2,806	3,291	3,709	3,761	6,666	8,173	10,680	15,800	15,556	21,671	20,757
Belgium	2,353	1,645	1,389	1,183	1,033	1,308	1,914	2,848	2,016	2,209	2,169
Denmark	5,692	5,241	5,097	5,315	5,057	5,752	4,699	5,416	3,598	3,037	2,130
Scotland	7,016	6,827	7,292	7,999	10,324	10,796	10,471	10,946	8,915	7,586	8,840
Norway	1,994	1,606	1,212	1,042	1,028	1,100	1,053	1,429	1,367	974	828
Poland	3,694	4,838	5,888	6,826	8,640	10,460	11,977	17,074	14,917	18,757	17,187
Sweden	4,808	3,929	3,820	3,486	3,776	2,820	2,630	4,178	2,576	1,913	1,738
Czechoslovakia	3,159	3,548	4,152	5,343	7,713	12,787	17,438	23,556	22,003	31,940	29,824
America:											
Canada	.....	9,068	7,327	7,234	8,501	8,790	8,877	7,534	5,913	3,912	.....
United States†	146,575	119,831	97,811	94,696	106,924	991,416	85,365	66,576	70,829	56,690	48,613

* Epidemiological Report of the Health Section of the Secretariat of the League of Nations, March-April 1934.
† Besides the District of Columbia, 47 states in 1923 and 1924; 48 since.

In 1933 the following eleven cities of considerable size had no diphtheria deaths: Duluth, Elizabeth, Hartford, Rochester, Salt Lake City, Seattle, South Bend, Spokane, Springfield, Syracuse, Yonkers. Some of the very largest cities in the United States had death rates much less than even the low average. Some of these and their death rates per hundred thousand in 1933 were as follows: Philadelphia, 0.7; New York, 1.2; Baltimore, 0.7; Chicago, 0.2; Milwaukee, 0.8; Omaha, 0.9; St. Paul, 1.1; Minneapolis, 1.4; Oakland, 0.7; San Francisco, 1.2.

Judging by these facts, the conclusion seems inevitable that the very classes for which insurance is proposed are now receiving under a system of private medical practice, in the United States and Canada, medical care far superior to that which is supplied when the same classes are put under an insurance system.

That this conclusion is justified is also the opinion of the observers in countries now having insurance. Edwin H. T. Nash, public health official of England, in discussing "The Present Position of Diphtheria Immunization" in the *Journal of State Medicine*, September 1934, pages 522 to 526, says:

> At long last this country is really waking up to the importance and safety of Immunization against Diphtheria.
>
> America has been some ten years ahead of us in this matter, due to a certain extent to the American flair for wholesale publicity together with a more polyglot population in its big towns that is more susceptible to flamboyant methods of propaganda than our more sober-minded and less emotional people. . . .

As a contrast compare London, with 1 per cent of its school population immunized, with New York State, where the numbers immunized exceed 700,000. We have no figures in this country that can compare with those on the other side of the Atlantic. None of us who are immunizing on a larger scale here can approach the figures in some of the American towns where diphtheria is being steadily eliminated. Take Hamilton, Ontario.

In 1922 there were 32 deaths from diphtheria, when immunizing was begun.

In 1925 the deaths had dropped to 14; in 1929 to 1; in 1930 there were 2, and in 1931 there were none at all. . . .

Just as I finish writing this paper, the *Medical Officer* of the 12th May reports that "The diphtheria ward of the Alexandra Hospital at Montreal has been closed because there are not enough cases to warrant it being kept open. It was in 1928 that immunization against diphtheria was started in Montreal. The death rate that year was 28 per 100,000. In 1929 it fell to 15, in 1930 to 10, in 1931 to 6, and in 1933 to 2. Last year 52,063 Montreal children were immunized.

Association News

ANNUAL CONGRESS ON MEDICAL EDUCATION, HOSPITALS AND LICENSURE

Thirty-First Annual Meeting, held in Chicago, Feb. 18 and 19, 1935

(Continued from page 1249)

DR. MERRITTE W. IRELAND, Washington, D. C., in the Chair

FEBRUARY 18—AFTERNOON

TUBERCULOSIS: INSTITUTIONAL AND EDUCATIONAL ASPECTS

Objectives of the Campaign Against Tuberculosis

DR. KENDALL EMERSON, New York: With the founding of the Trudeau Sanatorium fifty years ago there was planted the seed of a sturdy tree, which has since spread its protecting branches over the lives of thousands of patients, at the same time removing from contact with their susceptible neighbors an equal number of foci each capable of indefinitely spreading the disease. With therapeutic aid in abeyance, with the initial step in handling any infectious disease, segregation, already under way, the first decade of the twentieth century offered the opportunity to gird our loins for a grapple with the leading cause of human mortality. Our resources were the medical profession and the public health service. Were these sufficient? Osler, Welch, Trudeau, Biggs, Bowditch, Billings, Janeway, Cushing, Musser and many other leading physicians of that period thought not, and it was they who added the National Tuberculosis Association to the attacking forces. Since then the nursing profession, social service and public education have all entered the ranks and the campaign has become proportionately complicated. From its inception, leadership has been and always will be in the hands of the medical profession. To the medical profession belongs the credit for recognizing and adopting the basis on which to found and build an effective campaign for the control of tuberculosis. Their objective was to secure the cooperation of the public in the project, and their method was through popular health education. It was agreed that the medical profession unaided had not the time or the training to assume the whole task, so it was decided to give birth to a volunteer health association, which should have both physicians and prominent laymen on its board of directors and which under adequate professional guidance should cooperate in getting across to the public the essential elements of health education. Two thirds of the board still consists of doctors, and there is good professional representation on the boards of all the affiliated and local associations, assuring essential medical direction.

The National Tuberculosis Association considers itself but one factor in the fight for the control of tuberculosis; it covets no position of dominance; its aim is to be a supporting educational arm of the public health service, working always under the skilled guidance of medical specialists. Under any other conditions it could feel no justification for its solicitation of funds from the public to enable it to make its due contribution to a properly coordinated general campaign against the disease. One of the first handicaps to the progress of the campaign was found to be lack of adequate knowledge of the tubercle bacillus itself. Several discoveries of profound significance had already been made even at the beginning of the organized campaign. Among these was Theobald Smith's identification of the bovine type of bacillus, resulting in the salutary and effective attack on the disease at one of its sources, infected cattle. Here was an objective calling for immediate action and from the start purification of dairy herds, pasteurization of milk supplies and inspection of abattoirs have been aims relentlessly pursued by the campaign. Proof of the transmission of tuberculosis through direct contact with infected persons or with freshly deposited sputum led to antispitting campaigns and laws as well as to the abolition of the common drinking cup and towel and the inspection of food handlers and the regulation of restaurants and drinking places.

Clinically the early diagnosis of tuberculosis is of vital importance both for the sake of the patient's ultimate welfare and for the protection of the public against an occult spreader of the disease. Two priceless discoveries of those earlier days came to hand as aids to this most important task of the clinician: the tuberculin test and the roentgen examination of the chest. From the administrative point of view an essential in eradicating infectious disease is the accurate and complete reporting of cases.

The economic and social problems presented by tuberculosis are recognized not only as those pertaining to any infectious disease but also as those inherent in other chronic illness, entailing long disability, loss of earning power, expensive treatment and the suffering of dependents. These are definitely social problems in a field beyond the borders of strictly medical responsibility. The first effort to meet them systematically lay in the development of the public health nurse. Little by little the social worker has assumed an increasing share of this burden until now the care of a tuberculous patient, in the middle and less privileged classes of society, is clearly recognized as a dual problem, primarily medical but with an essential economic factor. One of the outstanding aspects of the campaign in recent years has been to draw into proper relationship these two phases of the tuberculosis problem as they affect the majority of cases individually and the whole community collectively. From the age of 6 to 16 the entire population of the United States is assembled in school. These years offer a priceless opportunity to put health education to work. It is an opportunity that has been sadly neglected up to very recent times, although for twenty years the sponsors of the campaign have been urging it and the Tuberculosis Association in particular has made large scale experiments to bring it about. In 1900 the death rate from tuberculosis was just over 200 per hundred thousand of the population; last year it was probably below 60 for the general public, and Dublin announces a rate just under 50 for the insured industrial group. Save in those epidemics yielding to specific measures of prevention, no similar achievement is on record in the history of human disease. How much the campaign has contributed, no one can say. It can scarcely be accused of holding up progress. Yet right here complacency meets a rebuff for, although the disease has been successfully demoted from first to seventh place as a cause of death, it still leads in the age group from 20 to 40, usually considered the prime of life. On the other hand a comforting example of what more may be accomplished by intensification of known methods is furnished in the Cattaraugus County demonstration, in which in seven years the rate has dropped from 70 to 38 per hundred thousand. Outstanding among objectives of the campaign is the relentless pursuit of medical and social research to shed light on the darkened areas in the field of epidemiology.

Within the limits of accepted knowledge the following procedures appear sound: protection of the milk supply; early discovery of cases; segregation of infectious cases; protection of the child against first infection or, if already sensitized, against reinfection; elimination of proved industrial hazards; more attention to age and racial groups that show the highest indexes of infection; promotion of acceptable standards of housing and nutrition; intensive research, and eternally hammering away at the task of teaching a none too receptive public how to take care of itself through health education. How is such

a program to be prosecuted? The answer points in just one direction: toward the practicing physician. The outstanding objective of the campaign against tuberculosis in the immediate future is the enlistment in that campaign of greater professional interest. Practical control of the disease can be visualized by the more intensive use of even the imperfect methods that are already familiar. Slower progress may be expected as the fighting is aimed at the more resistant areas. Skill, endurance and imagination are called for in dislodging the enemy from his more entrenched positions. These can be supplied by the practicing physician alone.

DISCUSSION

DR. HENRY C. SWEANY, Chicago: There is only one objective in this work, viz., to eradicate tuberculosis; but in accomplishing this end the problem becomes many sided. Of all the lapses, it seems that the greatest lies at the door of the medical profession itself. The physician must take more interest in what always will be his own work. It is regrettable that practitioners of medicine have not kept abreast with the newer knowledge of tuberculosis. For the cause of this, one does not have to look far. First, tuberculosis was for a long time considered a hopeless disease. Second, it was a long drawn out process when not fatal. Third, the chronicity of the disease did not permit of as sudden or striking results as could be obtained with acute diseases. The result was that the tuberculosis field was almost completely deserted by physicians. Fortunately for the tuberculosis problem, a few doctors contracted the disease in those early days, else we should still be leaving the care of the tuberculous to laymen and nurses. From Trudeau down to recent times the bulk of tuberculosis men have been those who had contracted the disease and were forced into the work. There is no excuse for such conditions to prevail today. The disease may now be treated as actively as any other disease. To the indispensable hygienic treatment there have been added the newer methods of diagnosis and newer forms of surgical treatment. Practitioners represent the greatest possible potential factor in early case finding, but much of their opportunities are wasted because of lack of knowledge of the disease. The most important problem, therefore, resolves itself into an educational campaign on behalf of this group. More attention should be given to curriculums in medical schools. Postgraduate work in tuberculosis should be given. Students should be taught the characteristics of early infection, its pathology in primary and postprimary types, its clinical course, its interesting roentgenologic aspects and the immunity and allergic reactions. Many times early lesions are missed on physical examination. It is of the greatest importance to teach that the early lesion is predominantly of a benign character. It does not always produce clinical symptoms, nor are the physical manifestations constant. So many times in the past these early cases have been missed by the physician, that his confidence has been shaken in his ability. With this foundation, the frank clinical disease will have more meaning; the doctor will regain his place in the tuberculosis campaign, and the greatest need will be supplied.

The Undergraduate Teaching of Tuberculosis

DR. JAMES ALEXANDER MILLER, New York: I approach the question of the undergraduate teaching of tuberculosis to medical students as a part of the course in internal medicine and to a lesser degree also in surgery, rather than from the point of view of a specialty in medicine.

The idea that tuberculosis is a systemic infection, which develops clinical manifestations in practically all organs of the body should constantly be borne in mind. At graduation the usual medical student has an inadequate appreciation of the problems of tuberculosis, and his preparation for the diagnosis and treatment of the disease is far from satisfactory. Students first come in contact with cases of pulmonary tuberculosis through clinical material employed for the teaching of physical diagnosis, an approach which appears to give them a lasting impression that the physical signs are of predominant importance in the recognition of the disease. As a matter of fact, the physical signs in such cases are usually those of lesions already far advanced. It is now being generally recognized, as Bräuning has put it, that early pulmonary tuberculosis must be seen, not heard. This means that a much greater emphasis than at present should be placed on the study of roentgenograms of the chest. It would appear desirable from the first contact of the student in his second year with pulmonary tuberculosis that in connection with the teaching of physical diagnosis there should be emphasized its correlation with the corresponding pathologic conditions at autopsy and the study of the pathologic changes during life, which is afforded by the roentgenogram.

The close personal relationship established between physician and patient is the best sort of training for the development of that broad understanding which we like to think of as one of the most admirable qualities of our profession. Nowhere can this be developed so well as in the management of chronic disease such as tuberculosis, demanding as it does a full knowledge of all the personal, social and economic factors involved, as well as a close scrutiny of many symptoms, which are often slight and which require painstaking study to appreciate their significance. To place before the student the necessary clinical material in a proper way, a special chest service and a properly trained staff are essential. This service should be closely integrated with that of internal medicine; not alone should the members of the staff be specialists in chest diseases but they should also have a broad fundamental experience in general medicine.

Because the study of pulmonary tuberculosis affords the opportunity for special training in chronic diseases of the lungs that are not tuberculous, I would emphasize the importance of a general chest service for chronic pulmonary disease, including pulmonary emphysema and fibrosis, bronchiectasis, pulmonary abscess, pneumoconiosis and malignant diseases of the lung. If to this material are added the numerous incidental medical and surgical complications that occur in the course of tuberculosis and the incidental complicating general diseases that occur in any such service, we have offered to us a wide variety in the teaching material available for students, which, if properly studied and properly taught, deserves to have such a service rank in importance with the regular general medical service in the assignment of teaching hours for the undergraduate student. If there is added to this the opportunity for a few days of intensive study in a neighboring sanatorium to learn the details of the sanatorium methods of treatment and the wide variety in the course of the disease, a very satisfactory teaching setup for bed cases becomes available. In addition, there is an immense clinical material available for the study of ambulatory cases in the outpatient department. Here, too, the special tuberculosis clinic should include the other chronic chest diseases, and it is here that the opportunity for the teaching of early diagnosis is afforded and the follow-up after-care so important in the management of any chronic disease, particularly tuberculosis. But even more important than this, the outpatient department affords the opportunity for application of the modern principles of preventive medicine, and this is linked closely with the social problems of medicine.

The organized efforts for the prevention of tuberculosis through public health agencies as well as numerous coordinated private agencies, and the methods of health surveys as a foundation for preventive health examination are too little known by the medical student and consequently by the younger practitioner. The underlying principles involved can be taught to the student systematically in the tuberculosis clinic. Some efforts along these lines are already being made in some medical schools, but they are still inadequate. Properly developed, this combined medical, public health and social approach to the problem would lead to a broadening of the whole basis of the understanding of the students of the social background, so important in many diseases, and the many home and economic elements involved, and also would impress on them their responsibility for an understanding of the methods of spread of the disease and consequently their responsibility for its prevention as well as for its treatment. Through the social service department each student should have an opportunity to visit and study on the ground the homes and working places of a few patients under their care and to study the public health aspects of the problem as developed by examination of contacts, particularly children, the importance of untoward environment and the possibilities of its remedy.

Another important aspect of the problem is the psychologic one. Any patient with chronic disease faces a great psychologic and emotional problem as well as a physical one.

Of course, the study of the pathologic conditions involved is essential. The treatment of pulmonary tuberculosis has been revolutionized by modern collapse methods, beginning with artificial pneumothorax and going on to include the various more radical surgical procedures. The principles of modern thoracic surgery are largely based on experiences in pulmonary tuberculosis and similar chronic infections. It has developed on a sound basis only if there is a close cooperation between the surgeon and the internist. Therefore a chest service should have its closely correlated surgical unit and the student should have an opportunity to study the course and treatment as a whole under the combined guidance of both the internist and the surgeon. In general, we should begin the second and third year of the medical students' life with a somewhat different approach to chest diseases, emphasizing of course physical diagnosis but also enabling them to understand the limitations of this one method of procedure. Also, during this phase of training it would seem logical to begin to include x-ray and pathologic material, and all through the entire course much more training in the interpretation of roentgenograms should be afforded than now exists in most medical schools. The time is gone by when the practitioner in medicine would be satisfied to accept the report of the roentgenologist as giving him a full interpretation of the knowledge to be obtained by this important method of examination. It is in the fourth year, during the period of so-called medical clerkship, that most of this teaching material on chest diseases should be placed before the undergraduate student. Each student should certainly at least have one month, and preferably six weeks, of continuous all-day study, with a schedule including the various angles of approach. The Bellevue Hospital Service comprises 180 beds, mainly for tuberculosis, but between 15 and 20 per cent of all patients are suffering from chronic nontuberculous chest conditions. There are over 3,000 admissions each year. Many of the basic requirements that I have outlined as desirable for teaching tuberculosis to undergraduates have been provided at Bellevue. We feel that we need a little more time for each student, and that six weeks would be none too long for each fourth-year student to spend in our service. In general, the aim of our teaching is to provide first the material. This consists on the one hand of the patients specially selected because of their type of ailment, and on the other hand of the student, the material of which the physician is to be made. With this human material we provide the tools and the technic for the training of the student under expert guidance. He is also encouraged to learn to think for himself and thus to acquire wisdom rather than to accumulate knowledge. Having arrived at this point he may be a very well trained man, but he is not yet a physician. That end is achieved only if and when the trained man with all his technic turns to the consideration of the original material; that is, the human individual under his care. When the proper contact between the individual patient and the individual student occurs, then is created the spark which transforms the technically trained student into that rare product, the true physician. If, under the inspiration of proper leadership, this personal human interest can be widened to include the community environment surrounding the individual patient, one may expect to obtain that still rarer flower of medical education, the trained physician with social vision and broad human understanding.

DISCUSSION

DR. JAMES J. WARING, Denver: While I am in accord with Dr. Miller in recognizing the superiority of the x-rays to the stethoscope in the detection of minimal tuberculosis of the lungs, I would urge great care not to depreciate the art of painstaking physical examination. For the inexperienced student and the careless hurried doctor, the tendency is still, after the lapse of more than a century since its discovery, to reach for the stethoscope at the beginning of a physical examination rather than at the end. Care must be taken lest reliance on the x-rays lead to neglect of the development to the highest point of efficiency of inspection, palpation, percussion and auscultation. Tuberculosis must be studied throughout its entire course. Serial roentgenograms enable one to review, in a few moments, the long drawn out evolution of pulmonary tuberculosis. They are most instructive when they encompass months and even years and when carefully related to conduct and to incidental events of the patient's life. One's morbid existence is caught on the film and may be preserved indefinitely for leisurely study and instruction. Since infection, reinfection or complications may arise today or tomorrow, films should be preserved at least until the death of the patient. I am pleased that Dr. Miller dwelt on the emotional or psychic problems of the consumptive, because it gives me opportunity to speak of the work of the Psychiatric Liaison Department at the University of Colorado School of Medicine and Hospitals. This project, conceived by Dr. Franklin Ebaugh and supported by the Rockefeller Foundation, has been in operation only a few months under the capable direction of Dr. Edward G. Billings. It aims first to effect a more intimate relationship between the personnels of the Colorado General Hospital and the adjacent Psychopathic Hospital and, secondly, to establish psychobiology and psychiatry as efficiently functioning services in the outpatient medical and surgical clinics and the medical and surgical wards of the General Hospital. Through lectures, clinics, ward rounds, seminars, conferences and informal discussions with students and staff, it is hoped to develop a common sense psychiatric approach for the betterment of the patient's condition. The student is being taught in a very practical fashion the technic of discovery and relief of mental and personality disorders. Each day testifies to the success of the plan. In any brief consideration of the teaching of tuberculosis, one can only acknowledge the accuracy of Dr. Miller's premises and wish that every medical school could have a duplicate of the setup at Bellevue.

DR. J. N. BAKER, Montgomery, Ala.: This subject makes a strong appeal to those who are deeply interested in medical licensure. Medical schools are learning that the practice of scientific medicine today is about three-fourths preventive and one-fourth curative, and when they incorporate those principles into their daily teaching they are turning out practitioners on whom great reliance can be placed. It is gratifying to see the training they are now given as contrasted with the training of the practitioner who has been in active work for twelve or more years. One of the big problems in the control of tuberculosis is an extension of our educational methods down to the practicing physician of today. If the curriculum might somehow be permitted to seep down into the practicing physician of today, it would be an immense help to those who are trying to exercise control in the communicable diseases. If physicians can be made to realize not only that cure depends on early diagnosis but that their financial interests are materially enhanced through an early recognition and the proper application of modern surgical therapy to the treatment of that, some sort of dent will have been made in the problem.

DR. CHARLES J. HATFIELD, Philadelphia: At the University of Pennsylvania we endeavor to have the teaching of tuberculosis an integral part of the teaching of general medicine. It is the general practitioner who is going to come up against almost 100 per cent of the cases. All through our teaching we try to emphasize the preventive side, both on the personal, family lines and also on the epidemiologic lines, the community health. In the second year in Philadelphia, in the teaching of physical diagnosis, we have the use of tuberculous patients as contrasted with the normal chest. There is also fifteen hours devoted to the pathology of tuberculosis, lectures and laboratory work. Only five hours is assigned to the bacteriology of tuberculosis. In the third year, lectures on tuberculosis are included in the program of lectures on general medicine. But at the Phipps Institute we have tried to give an intensive survey of the whole field of tuberculosis. We allow only sixteen hours for this particular survey, but in that there are given to groups of sixteen four short lectures of only thirty minutes each. Then these groups of sixteen are split into groups of four, and those four are instructed for six hours, four different sessions, in the actual handling of tuberculous cases, starting with the history taking, physical examination, differential diagnosis, treatment

and prophylaxis. Then to groups of eight a careful outline of roentgenologic work is given. To groups of eight, again, there is an hour assigned for the discussion of the laboratory procedures useful in diagnosis and prognosis. To groups of sixteen, two different sessions are devoted to instruction in treatment, medical and surgical, and, again, to groups of eight there are two sessions devoted to a demonstration of surgical treatment and its results, including fluoroscopic examinations of patients and demonstrations of the technic of artificial pneumothorax. To groups of sixteen a session is devoted to the presentation of pulmonary tuberculosis as a public health problem. Throughout the program emphasis is laid on the preventive side of tuberculosis from the standpoint of the patient, his family and the community. In the fourth year, from eight to ten hours is devoted to bedside instruction in the tuberculosis department of the Philadelphia General Hospital. Students of the Graduate School of Medicine of the University of Pennsylvania are given a sixteen-hour course at the Henry Phipps Institute. The plan is similar to the course for third-year students, with, however, greater emphasis on physical examination and treatment. At least one clinical demonstration of phrenicectomy, pneumolysis and pneumothorax is provided.

DR. R. E. PLUNKETT, Albany, N. Y.: In Albany we have had the opportunity of watching the effects of Dr. Miller's program of medical education by virtue of our observations of physicians who have established themselves in the various parts of New York State. There isn't any question that Dr. Miller conveys to every medical student that the tubercle bacillus is the alpha of the clinical phases of tuberculosis and the omega of the public health features of that disease. If that is kept in mind, naturally, physicians not only will be tuberculosis conscious from the standpoint of the geographic distribution of pathologic conditions within the chest but also will at least look for its manifestations in the sociological and economic phases. In 1919 the state department of health of New York came to the conclusion that, if further progress was to be made in tuberculosis control, the physicians in the various parts of the state should be taken into the picture and that a place for the physician, a place for the public health official and a place for the sanatorium should be well defined. A consultation type of clinic was inaugurated, which since that time has been conducted in approximately thirty or forty counties throughout the state. No patients are accepted at those clinics unless they have an admission card from their family physician or, if they cannot afford a family physician, they may secure an admission card from the health officer of the community in which they reside. We have had 100 per cent cooperation on the part of the practicing physicians, and they think of tuberculosis not alone as a clinical entity but also from its public health significance. As a result of this development of good will we have established an esprit de corps with the physicians which, I think, correctly, has been paying benefits to the patients. The benefits accruing to the community cannot be measured in dollars. As a result of that service, for the last two years, of the cases which we have diagnosed as positive, one of every seven people who come into our clinics have clinical pulmonary tuberculosis, and one out of seventeen that are examined at these clinics is discovered as a new case of pulmonary tuberculosis. We have about 1,200 physicians participating in this service. Fifty-five per cent of our patients come to us giving a history of known contact with the disease. Among the females examined who gave a history of contact and who have been followed up, 58 per cent are in the minimal stage of the disease as against 44 per cent of the male cases. Of the noncontact groups there are 36 per cent of the females who are in the minimal stage, and 25 per cent of the males. In other words, over half of the cases that come to our clinic are in the minimal stage of the disease. The incidence in these groups is another interesting manifestation of the peculiarities of tuberculosis in contacts. In the females who know of no contact with the positive case, the peak of incidence is found between the ages of 25 and 35, whereas in the males who know of no intimate contact the peak of incidence is between 35 and 45. I want to compliment Dr. Miller because of the work he is doing in educating doctors in New York.

Some Historical Aspects of Tuberculosis

DR. LEWIS J. MOORMAN, Oklahoma City: Tuberculosis may have been the first-born of the mother of pestilence and disease. Exhumed skeletons of prehistoric periods bear the marks of tuberculosis. The Code of Hammurabi, written more than 2,000 years B. C., indicates a possible knowledge of tuberculosis. Aretaeus, in the first century A. D., gave accurate clinical descriptions of tuberculosis and suggested routine treatment similar to that employed today. Galen preserved the teachings of Hippocrates and recorded his own observations. He was one of the first to employ climate in the treatment of tuberculosis, recommending the balmy zones immediately surrounding Vesuvius. The period of the dark ages was characterized by twelve centuries of lethargy resulting from a combination of religious prejudices against the opening of the dead human body and a static condition of existing knowledge due to galenic fixation. The works of Aristotle, Hippocrates and Galen furnished the foundation for the renaissance of medicine in the fifteenth century, but no progress occurred until Sylvius, in the seventeenth century, gathered up the lost threads and added his work on the pathology of tuberculosis.

Not until 1761, a hundred years after Sylvius, can another genuine advance be recorded. Then came Auenbrugger "knocking at the human thorax." Fifty years later Laënnec put the cause of diagnosis forward with unprecedented rapidity. Laënnec's revival and amplification of auscultation and his invention of the stethoscope enabled Corvisart to check the results of percussion in the living body, whereas Auenbrugger may have failed to establish the value of his method because he could confirm his observations only at autopsy. Laënnec, more truly than any one who had gone before, brought together the varied clinical and pathologic manifestations of tuberculosis and proclaimed "the unity of phthisis." The great teacher Louis, who established clinical medicine throughout the world, correlated in a scientific way the symptoms elicited at the bedside with the pathologic changes found at autopsy and inaugurated valuable statistical methods of recording his observations. Virchow, advancing from Bichat's tissue pathology to cellular pathology, made valuable contributions to the knowledge of tuberculosis. However, he joined the dualist Schoenlein, who coined the word tuberculosis in order, as he thought, to differentiate the nodular tubercles from the cheesy patch characterizing phthisis. Thus is seen the perspicacity of Laënnec with reference to the "unity of phthisis" blocked by the unfortunate and misguided application of a scientific advance. Not until the discovery of the tubercle bacillus were the dualists routed and the unity of tuberculosis finally established. Villemin, Bodington, Beddoes, Brehmer, Dettweiler, Forlanini, Trudeau, Robert Koch and many others then made outstanding contributions.

As one studies the course of this malady, one is confronted with a strange paradox. The tubercle bacillus resident in the human organism gives rise to two distinct manifestations: the depletion of physical energy and the stimulation of mental activity. In those who are endowed with exceptional mental qualities and are at the same time suffering from tuberculosis, often there seems to be a strange psychic stimulus bent on creative accomplishment. In some individuals only the vision of death brings a consciousness of "the divine reality of life." It seems reasonable to say that the progress of medicine has been largely dependent on the stimulus of this dual influence. No doubt Galen periodically came under the spell of tuberculosis. He reports having had two physical breakdowns before he was twenty.

Franciscus Sylvius (1614-1672), who, it is thought, suffered from tuberculosis, not only stressed the importance of anatomic tubercle in the lungs but pointed the way for all great clinical teachers.

William Withering (1741-1799), reported as having died of tuberculosis, gave to the world "An Account of the Foxglove and Some of Its Medical Uses." What a godsend to fibrillators! He also advocated a therapeutic regimen approaching the modern treatment of tuberculosis.

Maximilian Stoll (1742-1787), who succumbed to tuberculosis, sharply defined its clinical manifestations. No doubt the consciousness of its presence in his own body had much to do

with his untiring interest. He succeeded de Haen at the University of Vienna, where he directed the clinic in the general hospital, exerting a wide influence in the field of clinical investigation. Corvisart translated Stoll's aphorisms ten years after the author's death. It was here he first learned of percussion. Had it not been for Stoll's influence, percussion might have remained dormant and untaught in the poor French translation that antedated that of Corvisart by more than a quarter of a century.

Benjamin Rush (1745-1813), according to Jacobson, was a victim of chronic tuberculosis. He was one of the first to give tuberculosis a place in the annals of American medicine.

Bichat (1771-1802), who died of tuberculosis at the age of 31, made a great contribution to pathology in that he progressed from Morgagni's organ pathology to tissue pathology within the organ.

Laënnec (1781-1826) died of tuberculosis at the age of 45. His reaction to his environment was much like that of St. Francis, Voltaire, Robert Louis Stevenson, Keats, Shelley and Sidney Lanier. With remarkable industry and conspicuous discrimination, "he drew up a minute history of nearly four hundred cases of disease" before he was 22 years of age. These carefully tabulated case histories served as a foundation for his future researches and discoveries. When Laënnec came upon the scene, the diagnosis of diseases of the lungs and heart was more difficult than that of any other internal organ. In a short time he had made the most difficult diagnostic tasks relatively easy. In half the time now allotted for a medical education, Laënnec, virtually without chart or compass, "observed, recorded, tabulated and communicated" practically all that is now taught with reference to the diagnosis of diseases of the thorax.

Louis (1787-1872), who was one of the world's greatest clinical teachers, also suffered from tuberculosis. When 34 years of age he gave up private practice to pursue his clinical and pathologic investigations, the results of which were reported in a volume of 600 pages known as "Louis's Researches on Phthisis." It is impossible to estimate the value of Louis's contribution to medical education. His spirit inhabits the wards of every well ordered hospital; his influence is evident wherever the principles of clinical medicine are taught.

DISCUSSION

DR. KENNON DUNHAM, Cincinnati: Dr. Moorman did not touch on the Biblical references to tuberculosis. The Egyptians, before the Jews left Egypt, had developed a great deal of medical knowledge, locked up in Deuteronomy and Leviticus. Moses wrote "Those who are stricken with cough after illness." It was known long before that. Along in 1700 the Mohammedans, the Arabians, were doing the best medical work, and they discovered tuberculosis in cattle. Therefore it became a fetish to have anything to do with eating cattle. The infectiousness of tuberculosis was also recognized a long while ago. Then there are two fundamental pieces of work which I think bear well on our work of the present day and which are not generally recognized. Birch Hirschfeld is the man who gave us the most perfect outline of the bronchial tree. In 1898 he showed that not in the apex but in the posterior part of the upper lobe was the place where one should look for the earliest finding of pulmonary tuberculosis. He wrote so clearly and so accurately that this was called the posterior apical bronchus of Birch Hirschfeld. Today a great deal is being said about the subapical tuberculosis in contrast to the apical lesions; also about subclavicular tuberculosis. That is an x-ray mistake. That is not below the clavicle but it is below the apex in the posterior part of the upper lobe, and Birch Hirschfeld is the man who should have the credit for that. In giving history to medical students, it is worth while to teach them the importance of the accuracy of the man who found certain things. William Snow Miller is the man working with Mall at Clark University, who worked out the anatomic unit of the lung which is absolutely essential to the understanding of pulmonary tuberculosis, especially so far as it refers to exudate. The biggest thing is to teach the student how to translate x-ray densities into pulmonary pathologic changes but especially, above everything else, into pulmonary anatomy. Dr. Hatfield has spoken about what they do in teaching tuberculosis in Philadelphia. We try in Cincinnati to make the student understand the five properties of sound as they vary over the normal chest. A class of four are put together, and they have to learn how the different breath sounds and percussion notes vary over those four normal chests, and then they are allowed to listen to a chest of tuberculosis. These are men after they have had their course in physical diagnosis. Then they are shown how the diseased chest differs from that. The big point is that in auscultation the breath sounds vary in various parts of the normal chest and over different chests that are perfectly well. In addition to that, disease varies greatly. When teaching tuberculosis, one should keep the fundamentals before one's students. First of all, they must learn the normal and compare that with the pathologic. That applies to the roentgenogram.

Function of the General Hospital in the Treatment of Tuberculosis

DR. J. ARTHUR MYERS, Minneapolis: The use of the general hospital for the care of tuberculous patients is not a new idea. Centuries ago, in Italy and Spain, these patients were freely admitted to such institutions. Bodington of England conceived the idea of congregating tuberculous patients in an independent institution. The hospital that he used for this purpose failed not only because of the lack of support of the medical profession and the public but also because of the active opposition which developed against his views. In 1858 Brehmer, with views somewhat similar to those of Bodington, established a special institution for the tuberculous in Germany. One of his medical assistants, Dettweiler, developed two similar institutions in that nation. After reading of the work of Brehmer and Dettweiler, Trudeau established the Adirondack Cottage Sanitarium at Saranac Lake, N. Y., in 1885. Although the Channing Home in Boston was in operation for the isolation and palliative care of consumptives as early as 1857, Trudeau's institution was the first in this country actually to offer any hope of recovery for the person who had clinical tuberculosis.

Since the time of Trudeau's initial step in this country, approximately 700 sanatoriums for the tuberculous have been constructed, and the actual bed capacity in these institutions now closely approximates 80,000. The work done by the physicians of these institutions will go down in medical history as one of the greatest accomplishments of the profession. The sanatorium contributed what has proved to be its greatest service; namely, the isolation of the patient. In the beginning of sanatorium work, to protect the entire nation against exposure through isolation of open cases must have seemed hopeless, because of the large number of sufferers from this disease. Today no one would doubt that taking about 80,000 persons with open tuberculosis out of their communities is having a very marked effect on present morbidity and mortality and will have a greater effect in the next generation. This work, together with that of private practitioners of medicine and the veterinarian's unequaled demonstration of tuberculosis control, has brought about an entirely different situation with regard to the tuberculosis problem than existed even one or two decades ago. As early as 1916 the National Tuberculosis Association went on record as recommending the use of general hospitals for tuberculosis. This action was reaffirmed in 1921 and again in 1924. In 1920 the surgeon general of the United States requested action by the American Medical Association concerning the admission of tuberculous patients to general hospitals and in 1921 the House of Delegates indorsed a recommendation to the effect that general hospitals be used in this capacity. Thus, the two most instrumental organizations in tuberculosis control have recommended that general hospitals be utilized in the program. Already a good many general hospitals have opened their doors to tuberculous patients. Moreover, there has been a recent awakening of the members of the medical profession to their responsibilities, the possibilities of marked achievement, the ease with which the disease is diagnosed, and the success with which it may be treated, that may be likened to the renaissance in general medi-

cine of a few centuries ago. This increased interest on the part of the general medical profession, together with the past accomplishments, has brought about a situation so different from that of the past and an outlook so hopeful that it can now be truthfully said that we have entered on a new era in the field of tuberculosis. The goal is to have diagnostic and therapeutic centers established in the offices of at least 100,000 physicians throughout the country, with the hospitals on whose staffs they hold membership offering adequate facilities for their patients who need hospital care.

Whenever a general hospital decides to set aside space for tuberculous patients, some objections are registered. If it is a private institution, patients and their families object to paying for the services rendered by the hospital and its staff. This is because of the fact that many of the sanatoriums are tax-supported institutions, which were originally intended for the care of the poor but which have in more recent years accepted patients regardless of the financial status on a part pay basis.

Another objection often voiced is that the general hospital is not capable of rendering as good service as the sanatorium. Obviously, the service will depend on the management of the institution. If service is poor in a general hospital, there is no reason why it should not be improved through change of management. There is nothing mystifying about the diagnosis or treatment of tuberculosis. The general treatment of tuberculosis consists of conservation of energy, adequate diet, and good atmospheric conditions. Strict or partial bed rest as required may be had in any good general hospital, and dietary needs can be provided. The open air treatment of tuberculosis is being rapidly abandoned. Any well ventilated room is adequate. Conditioned air is ideal, and there is little doubt that plants providing such air will be installed in large numbers of general hospitals during the next few years.

Collapse therapy is the most important special measure employed in the treatment of pulmonary tuberculosis. The most effective and most extensively used method of collapsing the lung is artificial pneumothorax. Artificial pneumothorax has long been carried out in the home and in the general hospital with satisfactory results. Surgery of the phrenic nerve, such as phreniphraxis and phrenic exeresis, is very valuable in properly selected cases. The nerve is easily accessible and any careful surgeon can quickly learn the necessary technic. When other methods of collapse therapy fail, extrapleural thoracoplasty is often indicated. There should be on every general hospital staff, and is on many of them, one or more surgeons especially interested in chest surgery, who, if not already trained, can soon become proficient in extrapleural thoracoplasties. Extrapulmonary tuberculosis often requires surgical treatment, such as that involving the bones, joints and kidneys. The tuberculous patient is not immune to diabetes, appendicitis, cholecystitis and pelvic disturbances. On the general hospital staff there are always members available who are especially interested in such conditions and by reason of training and experience are capable of providing the best treatment. Therefore the needs of the tuberculous patient can be adequately met by the general hospital. Indeed, some of the larger sanatoriums have been converted into general hospitals through the establishment of obstetric, pediatric, surgical, and nose and throat services, and other departments found in a general hospital.

Another objection to the general hospital admitting tuberculous patients is on the basis of contagion. There is no reason why contagion should be feared. The technic employed in any good contagious disease service is adequate; anything less than this introduces an element of danger. Unfortunately, in many cities only one or two general hospitals, and these usually are tax-supported institutions, provide contagious disease services. The result is that the private general hospitals lose all the work in this field, and the physician who diagnoses the case frequently loses it because he is not on the staff of the particular hospital providing such service. A contagious disease service added to every good sized private general hospital could be made to increase the revenue of the institution and, better than this, would make it possible for the hospital to render a much better service to the citizens of the community than it is now doing. The danger of contagion with reference to students of nursing and medicine in general hospitals, as well as sanatoriums, has received some emphasis but needs much more. In the Minnesota General Hospital for a number of years tuberculous patients have been admitted for chest surgery and similar procedures to the contagious disease service. Here it has not been unusual to have a patient with measles in one room, one with tuberculosis in the next, with diphtheria in the next, and so on. So far we have not seen a single case of cross-infection nor have we seen a nurse in this service fall ill from tuberculosis. During the past year we sent a questionnaire to all the students who had graduated from the University of Minnesota School of Medicine since 1920. Much to our surprise, among the physicians who graduated in the earlier years of this period only approximately 5 per cent have had tuberculin tests or x-ray film examination of their own chests, whereas, of those who had graduated in the last two or three years, about 97 per cent had been so examined.

It is a well established fact that, when symptoms of pulmonary tuberculosis appear from 80 to 85 per cent of the patients have moderately to far advanced disease; also, most tuberculous patients do not present themselves to physicians for examination before symptoms appear. Moreover, chronic pulmonary tuberculosis usually exists over two or more years before causing any outward manifestations of its presence. If the physician has detected their disease before it has broken down, such patients do not need to be admitted to a contagious disease service and, if he treats it adequately, the majority of such patients will never spread tubercle bacilli from that particular lesion. Patients with positive sputum should always be admitted to the contagious disease service. Many of them through collapse therapy will have their lesions brought under control so that their disease is no longer communicable to others. When this time arrives, they do not need contagious disease technic any more than the patient who has recovered from typhoid or diphtheria. However, in each of the three diseases one must constantly keep in mind the possibility of the carrier. The 80,000 beds now available in our sanatoriums are inadequate to solve the problem as quickly as it should be solved. There is no thought of displacing any sanatorium when the number of patients is adequate to keep it filled to capacity; it is only a matter of supplementing the very fine work now being done by these institutions.

Because the mortality and morbidity, as well as the number of potential cases of clinical tuberculosis, is rapidly decreasing, it would seem poor economy to provide for more sanatorium beds except in a few places where sanatoriums have been lacking. It would seem far wiser to use beds in general hospitals, of which there are vacant at this time approximately 150,000. Patients who can afford to pay for services should do so and those who cannot should have the fees of the hospitals paid from tax funds, as is done in the case of sanatoriums. It is far better economy for a political division to pay for its patients in general hospitals on a cost-plus basis than to erect new institutions. If the program of tuberculosis control continues to succeed, the demand for sanatorium and hospital beds will decrease rather rapidly; indeed, many now living should see the time when numerous sanatoriums and tuberculosis divisions in general hospitals will be closed for lack of patients. In fact, in one state the sanatorium capacity, which was frequently inadequate in the past, has now by reason of decrease in morbidity become greater than the demand. If in addition all physicians and general hospitals attack the problem, a tuberculosis situation can be created for the people of this country as good as that which has been created for cattle.

DISCUSSION

DR. EDWARD S. MCSWEENY, New York: Up to recently there was a general acceptance of certain fundamental principles of treatment of tuberculosis. Discussion during the last few years of newer methods seems to have created the impression that these principles have been abandoned by tuberculosis men and a whole new scheme of treatment adopted. So far as I know, nothing of the kind has taken place. Additions have been made to what we previously had but what we previously had has lost none of its own values and is still held precious. I am here as president of the American Sanatorium Association, and that is the brief I hold; but I shall try to give a fair presentation of the different sides of the matter. Bodington and Brehmer evidently thought of tuberculosis as some sort

of nutritional disorder. They had observed that patients who quite fortuitously rested in the open air and gave particular attention to their nutrition improved and of the few who stuck to it for a long time many apparently recovered. Out of these considerations, medical and personal, grew the concept of the sanatorium: a place located, built, equipped, staffed and managed for this particular purpose. If patients not very sick in the ordinary use of the terms must spend weeks or months in idleness in bed or on reclining chairs, freedom from the sense of confinement means much. So sanatoriums have open porches and angulated arrangements to insure breadth of outlook and a sense of freedom, lawns and flowers, woods, the open sky day and night, and all the factors that go to make for contentment over a long period of residence. Contrast this with the hospital, which may be located in the midst of a busy town, having nothing but closed rooms and wards. Brehmer's concept of a sanatorium remains valid. The problem narrows itself to a consideration of what has since been developed, which should modify our handling of it. Since 1858 there have been only two developments applicable to the treatment of tuberculosis of really first rate importance; namely, x-rays and the comparatively recent wide use of pneumothorax. More routine and research lung work with x-rays has been done in sanatoriums than in all other places combined. The x-rays offer no argument for or against sanatoriums or hospitals. Pneumothorax demands more consideration. Any one who does not recognize its value simply doesn't know enough about it. Its field has already been widened and, one hopes, will be still further developed. As an adjuvant and improvement to sanatorium treatment there is no question about it. Unfortunately, not all cases, for one reason or another, can be given it, nor in many can it be successfully maintained. The process too is not free of danger even to life, although this is small, but it is frequently accompanied by disabling effusions and all too frequently by empyema. As I said of the x-rays, the same is true of pneumothorax—more routine and experimental use has been made of it in sanatoriums than in all other places combined. Taking all these facts into consideration, I do not see how considered judgment of the values involved can arrive at any other conclusion than that the sanatorium with judicious use of these newer weapons remains the place *par excellence* to treat tuberculosis and that there is no sufficient reason to transfer the treatment of such cases when avoidable to hospitals, especially urban hospitals. Until sanatoriums were developed no method of curing tuberculosis had been evolved, although man had been familiar with the disease since the time of the Pharaohs, and they have a seventy-five year record of substantial achievement for their patients and the public. No such therapeutic system should be lightly discarded. What may be said on the positive side for general hospital treatment? I have answered this question in one aspect. That which remains is consideration of service to tuberculosis cases which must be treated out of sanatoriums and in this I see no reason why general hospitals should not participate, as Dr. Myers has so well discussed to their own and their patients' advantage. There are diagnostic problems best solved by hospital study, and in some places a hospital may serve a useful purpose as a collecting and distributing station. The best solution of a local problem may be a tuberculosis hospital or a tuberculosis wing or a tuberculosis ward, but I want to add my plea to Dr. Myers' that the general hospitals not too lightly dismiss consideration of their obligations and opportunities in this respect. The main consideration is that whatever service is set up it be manned by interested physicians and not be a mere adjunct to some general medical scheme. I have made an omission which was intentional. I refer to surgery, more especially rib resections. Such an operation, if successful, is a supreme procedure to the patient, but I am afraid that tuberculosis offers no field for the mechanical doll concept of the treatment of human ailments so prevalent among surgeons. Such work as I have referred to is a specialty within a specialty, and good results can be hoped for only at the hands of operators experienced as well as deeply interested in the problem, and naturally deft technicians with well trained operating teams and carefully applied preoperative and postoperative technic.

(To be continued)

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next three broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

April 18. "Catarrh."
April 25. May Day or All Year 'Round?
May 2. Being Your Age (4:30 p. m. Chicago daylight saving time, 3:30 p. m. central standard time).

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

April 16. Meeting a Challenge, W. W. Bauer, M.D.
April 23. Sudden Death, Morris Fishbein, M.D.
April 30. Child Health, W. W. Bauer, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Personal.—Dr. William B. Wells, Riverside, has retired as health officer of the city and of Riverside County on account of ill health; he has been succeeded by Dr. Wendell A. Jones, Riverside.——Dr. Esther Rosencrantz, associate professor of medicine, University of California Medical School, San Francisco, has been appointed medical adviser to the San Luis Obispo Tuberculosis Sanatorium.

Bills Passed.—The following bills have passed the senate: S. 21, proposing to regulate the production and distribution of serums, vaccines, bacterial cultures and viruses, and to require the licensing by the department of public health of persons manufacturing, preparing and distributing such products; and S. 468, proposing to amend the medical practice act so as to authorize courts on the application of the state board of medical examiners to enjoin the unlicensed practice of medicine.

Southern California Meeting.—The Southern California Medical Association will meet at the Arrowhead Springs Hotel, May 3-4. Among the physicians on the program will be:

Harold M. Walton, Loma Linda, Blood Picture in Hodgkin's Disease and Polymyositis, with Special Reference to Eosinophilia.
George Franklin Farman, Los Angeles, Treatment of Gonorrhea.
Harris Garcelon, Arrowhead Springs, Mucous Colitis.
Adelbert M. Moody, San Francisco, Endometriosis of the Appendix; Cysticercus Cellulosae.
Percival A. Gray Jr., Santa Barbara, Hypoglycemic Headache.
Albert H. Elliott Jr., Santa Barbara, Studies in Peripheral Vascular Disease.
Walter F. Pritchard, San Bernardino, Intravenous Urograms.
Albert D. Neubert, Redlands, Spinal Anesthesia.
Mark A. Glaser and Herman M. Beerman, Los Angeles, Depressed Skull Fractures: Clinical and Experimental Study.
John C. Jones, Los Angeles, Surgical Treatment of Chronic Empyema.
Joseph A. Pollia, Los Angeles, Malignancy of the Heart.
Harry H. Wilson, Los Angeles, Management of Alcoholism.

COLORADO

Personal.—Dr. Roy L. Cleere, Denver, has been named a member of the state board of health, succeeding Dr. Samuel R. McKelvey, Denver, who had served on the board since 1911.

Bill Enacted.—S. 277 was approved by the governor, April 1, making it unlawful for any person to receive hospital care with intent to defraud the hospital of the amount due it for such service and also making it prima facie evidence of intent to defraud for a patient to leave a hospital without paying his bill.

Bill Introduced.—S. 581, to amend the laws relating to the practice of chiropody, proposes, among other things, to enlarge the scope of a license to practice chiropody. The bill proposes to permit chiropodists to examine, diagnose or treat medically, mechanically, surgically or by electrical and manipulative means, or by bandaging and strapping, the ailments of the human foot.

CONNECTICUT

Changes in Health Officers.—Dr. Harry B. Smith has been appointed superintendent of health of the town of West Hartford, succeeding Dr. Theodore F. Foster, resigned. Dr. Donald W. Herman has been named health officer of Winsted, succeeding Dr. Horace W. Ward, who had held the position since 1923, and Dr. Louis Howard Wilmot succeeds Dr. William H. O'Neil as health officer of Ansonia. Dr. O'Neil had occupied the position since 1928.

Bill Passed.—S. 456 has passed the senate, proposing to supplement the pharmacy practice act by providing that a store not a licensed pharmacy, which has been licensed to do so by the commission of pharmacy, may sell proprietary and "patent" medicines if they are in sealed containers labeled and accompanied with directions for use and with the name and address of the manufacturer or distributor. Such "patent" and proprietary medicines, however, must not contain alcohol in excess of the amount necessary for use as a solvent or preservative and must not contain more than 2 grains of opium nor more than one-fourth grain of morphine nor more than one-eighth grain of heroin or 1 grain of codeine.

Sound Motion Pictures of Infant.—The first public showing of sound motion pictures of the life and growth of the human infant produced by the Yale Clinic of Child Development was given in New Haven, February 16. According to an announcement, the films were assembled from scientific records collected by the clinic over a period of years and are intended for general educational and study purposes. The subjects include a description of the methods of studying infant behavior; early and later stages in the growth of infant behavior; posture and locomotion from creeping to walking; a baby's day at twelve weeks; a thirty-six weeks' behavior day; a behavior day at forty-eight weeks; behavior patterns at one year; learning and growth, and early social behavior. The narration in the picture is by Dr. Arnold L. Gesell, director of the clinic.

FLORIDA

Mosquito Eradication and Malaria.—The Florida board of health began a state-wide campaign of mosquito eradication in February. Cooperating with the board are representatives of the U. S. Public Health Service, the bureau of entomology and the Rockefeller Foundation. In the first ten months in 1934, 330 deaths from malaria were reported; in 1933 the total was 373.

Society News.—At a meeting of the Duval County Medical Society, March 5, a symposium on syphilis was presented by Drs. Bertram F. Woolsey, Alan D. Brown, Lucien Y. Dyrenforth, William W. Kirk and James H. Randolph. Dr. Henry Hanson read a paper on "Survey of the Maternal Mortality in Florida." All are from Jacksonville. Dr. David D. Berlin, Boston, addressed the society, February 5, on "Present Status of Total Thyroidectomy in the Treatment of Congestive and Anginal Heart Failure."——At a recent meeting of the Pasco-Hernando-Citrus County Medical Society, Dr. Samuel C. Harvard, Brooksville, read a paper on "Cancer of the Breast."——Speakers before the Dade County Medical Society in Miami, March 1, were Drs. Marion C. Wilson and Stewart Lee Jeffrey on endometriosis and dengue, respectively.

GEORGIA

Bill Passed.—H. 229 has passed the house, proposing to establish a special committee of the house and senate to formulate and to recommend to the next session adequate plans for the hospitalization of the indigent sick.

Personal.—Dr. Hugh B. Senn, Newberry, S. C., has succeeded Dr. Guy G. Lunsford, Millen, as health officer of Jenkins County. Dr. Lunsford resigned to become chief of the division of county health work of the state department of health.——Dr. Herbert B. Kennedy, Atlanta, has been appointed associate medical director of the Woodmen of the World, with headquarters at Omaha.

Hospital News.—A new contagious disease and outpatient wing was recently added to the University Hospital of the University of Georgia, Augusta. A memorial gift of $18,000 was presented to the institution by Mrs. John W. Herbert, Augusta, to equip the addition, newspapers reported. The first floor of the new building, which was named for Milton Antony, founder of the medical school in 1828, is the outpatient department of the University Hospital, while the second floor is a contagious disease unit. Funds for the erection of the structure, which cost $90,000, were obtained from the alumni association of the school of medicine, a public works administration grant, the city of Augusta and the county of Richmond.——The Hamilton Memorial Hospital, Dalton, which has been closed for the past year, was reopened March 4. Newspapers reported that the Civitan Hospital Board, Inc., will operate the institution.

IDAHO

Society News.—Gordon E. Davis of the staff of the laboratory of the U. S. Public Health Service at Hamilton, Mont., addressed the South Side Medical Society, Burley, February 18, on "Results of the First Ten Years' Use of Spotted Fever Vaccine." Dr. William F. Passer, Twin Falls, addressed the society, January 25, on "Anemia in Infancy and Childhood."

ILLINOIS

Society News.—At the quarterly meeting of the Iowa and Illinois Central District Medical Association, Rock Island, March 15, Dr. Emil Novak, Baltimore, discussed "Sex Differentiation and Intersexuality."——Speakers before the LaSalle County Medical Society in Ottawa, March 20, were Drs. Harry A. Singer and George de Tarnowsky, Chicago, on "Ulcer and Cancer of the Stomach" and "Cancer of the Bowel and Its Surgical Management," respectively.——Health Promotion Week will be observed in Illinois, April 28-May 4.——Dr. James H. Hutton, Chicago, discussed "Essential Hypertension and Diabetes Mellitus; Their Endocrine Aspects and Treatment by X-Rays" before the Adams County Medical Society in Quincy, March 11. In the morning he conducted a clinical conference on essential hypertension before the society.——The St. Clair County Medical Society was addressed in East St. Louis, March 7, by Dr. Williams McKim Marriott, St. Louis, on "Practical Points in Pediatrics."——Dr. Julius H. Hess, Chicago, addressed the Champaign County Medical Society, Champaign, recently, on diagnosis of children's diseases.

Chicago

Society News.—Speakers before the Chicago Urological Society, March 28, were Drs. Eugene A. Ockuly, Toledo, Ohio, among others, on "Osteomyelitis Following Lesions in the Genito-Urinary Tract."——Dr. Austin A. Hayden discussed "Hyperesthetic Rhinitis Ionization" before the Chicago Laryngological and Otological Society, April 1.

Capps Prize Awarded to Dr. Gulbrandsen.—The Institute of Medicine of Chicago has awarded the Joseph A. Capps Prize for 1934 to Dr. Lars F. Gulbrandsen, instructor in pathology, bacteriology and public health, University of Illinois College of Medicine, for a paper on "Invasion of the Body Tissues by Orally Ingested Bacteria and the Defensive Mechanism of the Gastro-Intestinal Tract." The prize of $500, established by an anonymous donor in honor of Dr. Joseph A. Capps, is awarded annually for the most meritorious medical research by a graduate of a medical school in Chicago completed within two years after graduation.

Personal.—Dr. Max Thorek was awarded the scrolled silver urn by the Hong Kong University of China at the recent international competition of camera art, for his picture "Odalisque," according to the Chicago *Tribune*.——Dr. Clarence A. Neymann sailed from New York, March 16, for Belgium, where he was invited as Committee for Relief of Belgium exchange professor to lecture at the Universities of Ghent, Louvain, Liége and Brussels on "Electropyrexia in the Treatment of Disease." He will address the Royal Medical Society of London this month on the same subject.——Dr. James P. Henderson observed the completion of fifty years in the practice of medicine, March 10; his father, Dr. Harvey Dinwiddie Henderson, practiced medicine in Salem, Ind., for fifty-four years.

IOWA

Bill Introduced.—S. 336 proposes to repeal the law regulating the sale, distribution and possession of narcotic drugs and to enact what apparently is the uniform narcotic drug act.

LOUISIANA

Personal.—Dr. Gideon Douglas Williams, Lake Providence, director of the East Carroll Parish health unit, has been appointed in charge of the Ouachita Parish health unit, succeeding Dr. John W. Williams, Monroe, who resigned to become health director of Asheville, N. C.——Dr. James C. Sartor, Rayville, has been appointed a member of the state board of health, succeeding the late Dr. John L. Kelly, Oak Grove.

University News.—Bids will be opened this month for construction in New Orleans by Louisiana State University of a fifteen story dental and pharmacy school building, as a part of the medical center expansion program at the institution. Planned for occupancy next fall, the new building will be

erected on the grounds of Charity Hospital at a cost of $2,500,000. It will be equipped with classrooms and laboratories for the teaching of dentistry, pharmacy, medicine and surgery. The expansion program will also include the rehabilitation of the hospital at a cost of $8,000,000, it was stated.

MARYLAND

Bill Passed.—S. 211 has passed the house and the senate, proposing to authorize corporations to organize under the corporation laws of the state for the purpose of operating a nonprofit hospital service plan.

Bill Enacted.—H. 70 has been enacted as chapter 59, Laws, 1935. This new law repeals the laws regulating the possession and distribution of narcotic drugs and enacts what the draftsman of the act cites as the "uniform narcotic drug act." The bill, however, differs from the model uniform narcotic drug act in some important particulars. It omits the provisions in the model bill intended to limit the gross quantity of a habit-forming drug a person can buy in exempt preparations within a period of forty-eight hours.

Child Health Conferences.—A total of 9,749 children were examined in the child health conferences sponsored by the state department of health in 1934. Of these 2,490 were free from conditions in need of correction; 1,465 were underweight or gave other evidence of malnutrition; 3,492 needed dental attention. Unfavorable conditions of the lungs were noted in fifty-nine and of the heart in 245. In the 651 conferences held, 417 communities were represented. Medical treatments were not given, but children needing care were referred to their own physicians and prompt correction was urged.

Birth and Deaths in 1934.—There were 6,631 more births than deaths in Maryland in 1934, according to the state health department. For the year a total of 27,584 births was recorded and 20,953 deaths. There were twelve deaths in each thousand of the total population; this was offset by sixteen births, the report stated. The degenerative diseases of middle age and of the older age groups were responsible for 11,110 deaths, more than half of the total number at all ages and from all causes. Heart disease led the list of causes with a total of 4,502; then diseases of the kidneys, 2,347; cancer, 2,122; cerebral hemorrhage, 1,742 and diabetes, 397 deaths. Tuberculosis was responsible for 1,333.

MASSACHUSETTS

Communicable Diseases Decline.—Figures released by the state health department to the newspapers indicate that communicable diseases notably decreased in 1934. There were 631 cases of diphtheria as compared with 1,041 for 1933. A new low point was noted for typhoid, with 135 cases as against 162. Only seventy-five cases of infantile paralysis were reported, as compared with 353 the previous year. Scarlet fever, with 8,393 cases, reached the lowest level recorded since 1922, and for the second consecutive year no smallpox was reported. Measles, however, on account of the widespread epidemic in the eastern half of the state in the early part of the year, reached the highest level ever recorded, with 44,818 cases. The percentage of deaths was lower than ever previously recorded except in 1933.

Society News.—The Massachusetts Medical Society is making a survey of the adequacy of medical service in the state. When the data have been tabulated from questionnaires, a report will be published.——Dr. Paul R. Withington, Milton, was elected president of the Massachusetts Association of Boards of Health at its annual meeting, January 31.——Speakers before the New England Heart Association in Boston, March 25, included Drs. Maurice A. Lesser on "Primary Bilateral Pulmonary Thrombosis" and Frederick H. Pratt, "A Transitional Region Between Skeletal and Cardiac Muscle."——Speakers before the Springfield Academy of Medicine, February 12, were Drs. Rosco G. Leland, Chicago, and Nathan B. Van Etten, New York, on medical economics.——A symposium on the surgical treatment of pulmonary tuberculosis constituted the program of the Plymouth District Medical Society, March 21; speakers were Drs. Bradford H. Pierce, Roy F. Littlehale, John A. McCarthy, Ebenezer K. Jenkins, South Hanson, and George A. Moore, Brockton.——Dr. Jacob Kaminsky, Waltham, addressed the Middlesex East District Medical Association, March 13, on "Physiopathologic Factors in the Treatment of Pulmonary Tuberculosis."——The Harvard Medical Society was addressed, March 26, by Drs. Joseph T. Wearn, Cleveland, on "The Circulation in Normal and Hypertrophied Hearts," and Claude S. Beck, Cleveland, "Establishment of Collateral Blood Channels to the Heart by Operation."

MICHIGAN

Graduate Courses.—The Michigan State Medical Society and the department of graduate medicine of the University of Michigan, Ann Arbor, are cooperating in a series of graduate courses, which began April 1. The courses will cover electrocardiographic diagnosis, surgery and diseases of the blood and blood-forming organs, among other subjects, and will extend over a period of several weeks.

Society News.—Dr. Cleveland J. White, Chicago, addressed the Calhoun County Medical Society, March 5, on "Diagnosis and Modern Treatment of Eczematoid Eruptions of the Skin, with Special Reference to Ringworm and Allergic Dermatosis."——George E. Brand, LL.B., president of the Detroit Bar Association, addressed a joint meeting of this group with the Wayne County Medical Society, February 25, in Detroit; his subject was "Common Problems Facing Law and Medicine." The medical society devoted its meeting, March 18, to a symposium on tuberculosis; speakers were Drs. Bruce H. Douglas, Eldwin R. Witwer and Willard B. Howes.——Dr. Arthur E. Schiller, Detroit, addressed the East Side Physicians' Association, March 14, on "Allergy in Skin Diseases."

Cancer Survey.—The prevalence of cancer in rural areas in Michigan will be determined in a survey to be undertaken by the state department of health under a grant from the U. S. Public Health Service. Only full time county or district health departments will be included in the survey, which will be carried out by Dr. Harold Kessler, Alpena. Practicing physicians will be consulted to ascertain such information as the number of cases of cancer known to them, age and sex distribution, and the location and type of the lesion. This survey follows one recently carried on in hospitals by Dr. Frank L. Rector, field representative, American Society for the Control of Cancer.

MINNESOTA

Symposium on Malignancy.—The annual symposium on malignancy of the Minneapolis Surgical Society was held at the auditorium of the Hennepin County Medical Society, April 4. Drs. Martin Nordland, president, and Kenneth Bulkley, chairman, made introductory remarks and the scientific program was presented by the following physicians:

Stephen H. Baxter, Melanoma.
Martin Nordland, Malignancy of the Thyroid.
Theodore H. Sweetser, Malignancy of the Urinary Tract.
Frederick A. Olson, Organization of Hospital Service for Diagnosis and Treatment of Malignancy.
Stanley R. Maxeiner, Carcinoma of the Stomach.
James A. Johnson, Treatment of Carcinoma of the Rectum by Cautery in Patients of Advanced Age, and Other Poor Surgical Risks.

Dr. Frederick A. Olson was elected president of the society recently; Dr. Richard R. Cranmer, vice president, and Dr. Edward A. Regnier, secretary.

MISSISSIPPI

Personal.—Dr. John C. McGuire, at various times in charge of county health departments in Kentucky, has been named full time director of the Copiah County Health Department, succeeding Dr. James T. Googe, who recently resigned to become assistant state health director of Florida.

Trend of Death Rates.—Death rates from the five major preventable diseases and the five major causes of death not subject directly to public health control for the period 1914-1933, were recently studied by the Mississippi Board of Health. In the former group (tuberculosis, malaria, pellagra, typhoid and diphtheria) a total of 5,530 deaths was recorded in 1914 against 2,546 in 1933, a decrease of 54 per cent. In the group not subject to public health control (heart disease, nephritis, cancer, homicide and automobile accidents), 3,276 deaths were reported in 1914 as against 5,346 in 1933, an increase of 63 per cent. The board points out that a comparison of the two groups shows that deaths from the five causes not under public health control are increasing at a rate 9 per cent faster than the deaths from the five preventable diseases are decreasing.

MISSOURI

Medical Library.—The library of the late Dr. Jacob Geiger, professor emeritus of surgery, St. Louis University School of Medicine, will form the nucleus of a medical library now being planned by the Buchanan County Medical Society. Dr. Geiger's collection has been donated to the society by his family. The late physician was dean and professor of surgery at Ensworth Medical College from 1883 to 1914, and a past president of the Missouri State Medical Association.

Memorial to Dr. Jackson.—The Jackson County Medical Society met at the Kansas City General Hospital, Kansas City, March 26, to honor the memory of Dr. Jabez N. Jackson,

who died March 18. Speakers included Judge James E. Goodrich, who spoke on "Jabez Jackson, Surgeon and Citizen," and the following physicians:

Frank C. Neff, His Influence on Local Medicine.
Frank D. Dickson, His Personal Qualities and Character.
Frank R. Teachenor, His Influence on National Medicine.
John M. Frankenburger, His Hobbies and Recreations.
Buford G. Hamilton, President of the American Medical Association.

Dr. Doisy Awarded Medal.—The St. Louis Medical Society presented a medal and certificate of award to Edward A. Doisy, Ph.D., professor of biochemistry, St. Louis University School of Medicine, at a meeting, March 19. Dr. Doisy is known particularly for his work on the estrogenic hormones and for the isolation and preparation of theelin. Philip A. Shaffer, Ph.D., professor of biological chemistry, Washington University School of Medicine, St. Louis, made an address before the medal was presented. The award of merit was established by the society in 1925. The recipient must be recommended by the medical faculties of both St. Louis and Washington universities and must be unanimously elected by open vote of the council at the annual meeting. The last award was made in 1927, when it was given jointly to Drs. Evarts A. Graham, Glover H. Copher, Warren H. Cole and Sherwood Moore in recognition of their work on gallbladder visualization.

NEBRASKA

Society News.—Dr. Ralph A. Reis, Chicago, addressed the Lancaster County Medical Society, Lincoln, March 5, on "Some Aspects of the Conduct of Normal Labor."——Dr. Chester Q. Thompson, Omaha, among others, addressed the Tri-County Medical Society of Dodge, Washington and Burt counties, February 25, on blood transfusion.——Drs. Floyd S. Clarke and Gustave W. Dishong, Omaha, addressed the Southwestern Nebraska Medical Society, February 14, in McCook, on "Nephritis in Children" and "The Nervous Patient and the Physician," respectively.——Dr. Emil Novak, Baltimore, addressed the Omaha-Douglas County Medical Society, Omaha, March 6, on "The Endocrines in Gynecology and Obstetrics."

NEVADA

Annual Registration Due May 1.—All persons holding licenses to practice medicine in Nevada are required by law to pay annually to the treasurer of the board of medical examiners, on or before May 1, a tax of $2. Failure to do so operates to forfeit a licentiate's right to practice medicine, and his license can be reinstated thereafter only on the payment of a $10 penalty.

NEW JERSEY

Graduate Course in Endocrinology.—Drs. Roy G. Hoskins, director of research, Memorial Foundation for Neuro-Endocrine Research, Harvard University Medical School, Boston, and Joseph M. Looney, director of laboratories, Memorial Foundation for Neuro-Endocrine Research, Worcester State Hospital, Worcester, Mass., conducted a graduate course in endocrinology, sponsored by the Somerset County Medical Society, the state medical society and Rutgers University, in February and March. Two sessions each were held in Skillman and Trenton, one each in Marlboro and Morristown.

NEW YORK

Bill Enacted.—A. 445 has been enacted as chapter 266, Laws, 1935, safeguarding the distribution of "dangerous caustic or corrosive substances," as defined in the federal caustic poison act, by requiring their labeling as poison.

Bills Passed.—A. 1861 has passed the assembly, proposing to amend the laws relating to the practice of chiropody by designating the practice of chiropody as the practice of podiatry and by creating an independent board of podiatry examiners. S. 1816 has passed the senate, proposing to accord to charitable and governmental hospitals treating persons injured through the fault of others liens on all claims, rights of action, judgments, settlements or compromises accruing to the injured persons by reason of their injuries.

Buffalo Alumni Meeting.—The annual spring clinical day of the Alumni Association of the University of Buffalo School of Medicine will be held April 20. Following is the program:

Dr. William Wayne Babcock, Philadelphia, Improvement in Management of Appendicitis.
Dr. Udo J. Wile, Ann Arbor, Mich., Skin Manifestations of Idiosyncrasy to Common Drugs.
Dr. Foster Kennedy, New York, Relation of Neurology and Psychiatry to General Medicine.
Dr. Julius H. Hess, Chicago, Chronic Intestinal Indigestion in Children, Celiac Disease.
Dr. Russell L. Haden, Cleveland, Agranulocytosis.
Dr. P. Brooke Bland, Philadelphia, Uterine Hemorrhage.

New York City

Alumni Reunion.—Alumni Day will be held at Long Island College of Medicine, Brooklyn, April 27. At the morning session Dr. Paul A. O'Leary, Rochester, Minn., will speak on "Modern Treatment of Syphilis"; at luncheon Dr. Henry Wallace of the class of 1890 will give reminiscences and at the annual banquet in the evening the speaker will be Dr. William Alanson White, superintendent, St. Elizabeth's Hospital, Washington, D. C.

Sentenced for Defrauding Students.—Two men were convicted recently of obtaining $500 from one premedical student and $900 from another by promising to have them admitted to medical schools. Beard John Dupree was sentenced to a term of from six months to three years in the New York County Penitentiary and Martin J. Phillips, a term of three months in the workhouse. During their trial, signed agreements between the defendants and the students were produced in evidence, containing legal contracts for these services. The scheme was exposed through the activities of Prof. William C. MacTavish of New York University.

Society News.—Speakers before the Medical Society of the County of New York, March 25, were Louis I. Dublin, Ph.D., on "Favorable Aspects of Heart Disease"; Dr. John R. Paul, New Haven, Conn., "Rheumatic Heart Disease," and Dr. Paul D. White, Boston, "Coronary Disease and Coronary Thrombosis in Youth."——Speakers at a meeting of the International and Spanish-Speaking Association of Physicians, Dentists and Pharmacists, March 23, were Drs. Emil Novak, Baltimore, on "Sterility and Endocrines"; Frederic Bierhoff, "Impotence in the Adult and Adolescent"; Charles F. Geschickter, Baltimore, "The Breast and the Sex Hormones" and Gerard L. Moench, "The Problem of Human Sterility."——The meeting of the Bronx County Medical Society, March 20, was devoted to discussions of fractures by Drs. Edward R. Cunniffe, Milton R. Bookman, Edwin A. Spies and Samuel Kleinberg.

Group Hospitalization Plan.—The United Hospital Fund announces completion of plans for launching a group hospitalization plan among approved hospitals in the metropolitan area. Frank Van Dyk, manager of the Associated Hospitals of Essex County, Newark, N. J., has been named executive head of the plan, which will be operated by the Associated Hospital Service of New York, a new nonprofit corporation organized under the auspices of the United Hospital Fund. Salaried persons and wage earners are eligible to participate; their dependents may be included later, it was said. The cost will be $10 a year, entitling the subscriber to three weeks of semiprivate hospital care on recommendation of his private physician. The physician's fee is not included. The new plan is the result of two years' study by a committee appointed in December 1932. Officers of the governing organization are Karl Eilers, president of Lenox Hill Hospital, president; Stanley Resor, member of the board of Manhattan Eye, Ear and Throat Hospital, and Dr. Walter T. Dannreuther, vice presidents, and Homer Wickenden, general director of the United Hospital Fund, secretary. More than fifty hospitals have been accepted for charter membership, it was announced April 1.

NORTH CAROLINA

Bills Introduced.—H. 769, to amend the osteopathic practice act, proposes to permit osteopaths to dispense and prescribe drugs. S. 411 proposes to prohibit the sale of bichloride of mercury "except on prescription of a person licensed to write prescriptions." H. 829, to amend the medical practice act, proposes, in effect, to permit the board of medical examiners to hold their meetings in whatever city or cities in the state they desire. The present law requires at least one meeting annually to be held in Raleigh.

OKLAHOMA

Personal.—Dr. Allen C. Kramer, Tulsa, has been appointed health officer of Tulsa County, succeeding Dr. Thomas W. Stallings.——Dr. Ernest L. Bagby, Vinita, has been appointed superintendent of the Oklahoma Institution for the Feebleminded, Enid. Dr. Bagby was formerly superintendent of the Western Oklahoma Hospital, Supply.

Bills Introduced.—S. 349, to amend the medical practice act, proposes (1) to require the board of medical examiners to hold regular meetings on the second Wednesday in June and December of each year, rather than the second Tuesday in March and September, and (2) to authorize the board to revoke the license of any licentiate who has been convicted of any felony in or without the state of Oklahoma, rather than,

as the present law provides, authorizing it to revoke the license of any licentiate who is serving a penalty on a felony or of any offense involving moral turpitude. S. 347 proposes to repeal the law regulating the sale, distribution and possession of narcotic drugs and to enact what apparently is the uniform narcotic drug act.

OREGON

The Oregon Pharmacy Act.—THE JOURNAL, March 9, commented on the provision of the Oregon pharmacy practice act, approved February 21, 1935 (Laws, 1935, ch. 55), that nothing in it should be construed to prevent the personal administration of drugs and medicines carried by physicians, dentists or veterinarians, "to supply the immediate needs of their patients." The chairman of the legislative committee of the Oregon State Pharmaceutical Association calls attention to another provision that nothing in the act shall interfere with licensed physicians and dentists supplying their own patients with such remedies as they may desire, provided that the physician or dentist does not keep a pharmacy or drug store. The provision authorizing practitioners of medicine or dentistry to supply remedies to their patients will presumably be construed to supplement and broaden the provision that limits physicians and dentists to the personal administration of drugs and medicines carried by them.

PENNSYLVANIA

District Meeting.—Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, will give an address at the annual banquet of the Tenth Councilor District Meeting of the Medical Society of the State of Pennsylvania in Beaver Falls, May 9, on "Plans for Social Security." Among speakers at the scientific sessions will be Drs. Bernard Fantus, Chicago, on "The Therapy of Colon Stasis," and Richard B. Cattell, Boston, "Diagnosis and Treatment of Cancer of the Colon and Rectum."

Bills Introduced.—S. 769, to amend the medical practice act, proposes (1) to designate the Bureau of Medical Education and Licensure as the Board of Medical Education and Licensure; (2) to require an applicant for a license to be a high school graduate and to have had two years (rather than one year) of college credits in chemistry, biology and physics prior to medical study; (3) to require an applicant to have had one year of internship but to eliminate the provision in the present law which requires that during that year of internship the applicant must have attended or participated in attending not less than six confinements; (4) to require "applicants foreign to the territory of the United States" to "present a certificate of United States citizenship or a declaration of intention"; (5) to provide that the provisions of the act shall not apply to any one actually serving as a "student intern under the supervision of the medical or surgical staff of any legally incorporated hospital" and to provide that the act shall "be construed as applying to hospitals employing on salary graduate interns whose services are confined to said institutions when they assume individual responsibility in the care of patients"; and (6) to permit the board to revoke or suspend a license "upon satisfactory proof of grossly unethical practice, of misleading public advertisements, or of any form of pretense which might induce citizens to become a prey to professional exploitation." H. 1959 proposes a system of compulsory and voluntary sickness insurance. The benefits proposed are to consist of cash and all forms of medical and dental service. Persons employed at "other than manual labor" and receiving wages in excess of $60 a week, farm laborers and persons employed by an employer having less than three employees in personal or domestic service are excluded from the compulsory insurance of the bill but are entitled to participate in the voluntary insurance. H. 1759, to amend the medical practice act, proposes to require the bureau of medical education and licensure to license, after examination, practitioners of various schools of drugless therapy, enumerating specifically practitioners of chiropractic, "naprathy," spondylotherapy, suggestive therapeutics, metaphysics, vita therapy, magnetic healing, naturopathy and physiotherapy. The bureau is to appoint three persons now licensed in drugless therapy from a list of seven names submitted by the Pennsylvania Association of Licensed Drugless Therapists, who are to conduct such examinations as in their judgment they deem necessary to determine the fitness of the particular applicant. H. 1772 proposes to make it a ground for divorce for either spouse to be "hopelessly and incurably insane." H. 1730 proposes to require state-aided hospitals to admit any indigent person who is seriously ill and who requires hospitalization. Every state-aided hospital caring for such an indigent person is to be compensated by the state.

Philadelphia

Medical College News.—Charles-Edward Amory Winslow, Dr.P.H., Anna M. R. Lauder professor of public health, Yale University School of Medicine, New Haven, Conn., delivered the Potter Memorial Lecture at Jefferson Medical College, March 29, on "A Physician of Two Centuries Ago: Richard Mead and His Contributions to Epidemiology."

Anniversary of Maimonides.—The chapters of Phi Delta Epsilon and Phi Lambda Kappa at the University of Pennsylvania, Temple University, Jefferson Medical College and Hahnemann Medical College sponsored a public meeting, March 30, to celebrate the octocentennial anniversary of the birth of Maimonides. Speakers were Dr. Victor Robinson, New York, on "Maimonides the Physician"; Rabbi William H. Fineschriber, "Maimonides the Rabbi," and Isaac Husik, Ph.D., professor of philosophy, University of Pennsylvania, "Maimonides the Philosopher."

Swindler Voluntarily Dislocates Vertebra.—A Philadelphia hospital reports the case of a man who sought medical attention for alleged injury received in a fall from a bus. Roentgen and clinical examination revealed a dislocation of the first cervical vertebra. The man refused morphine and anesthesia, insisting that the dislocation be reduced without either. He was placed in bed with traction and it was planned to make a cast in a few days. During the period of traction he communicated with the bus company and demanded $10,000 damages but suddenly settled his claim for $200. He then got out of bed, left the hospital and has not been heard of since. Investigation by the bus company revealed a long police record under a variety of names. In Philadelphia he gave the name James L. Carter of Oakland, Calif., and a companion claimed to be his brother. San Francisco authorities sent a photograph of one Donald Carlyle, who was identified in Philadelphia as Carter. In California he had collected $60 from a street car company because of an alleged injury to his wrist. Under the name of Albert Monroe he had received $250 on a fraudulent claim from a bus company in Los Angeles. The records indicated that he had been arrested other times on the Pacific Coast, as well as in St. Paul, and that he was wanted in Washington, D. C., in connection with a forgery under the name Donald Del Ruth. Other aliases listed in San Francisco include Patrick J. Holley, Buddy Ryan, Pat Ryan, C. Malone and Ben F. Tilley. Carter is from 25 to 30 years old, 6 feet tall, with brown hair. He is smooth shaven and weighs about 160 pounds. He said he was a photographer. His companion is from 22 to 25 years old, about 5 feet 7 inches tall, with dark brown hair, and weighs about 140 pounds. None of the records show that this man has presented a dislocation of the neck in any of his former activities, but the physicians who attended him in Philadelphia were of the opinion that this was not his initial performance.

Pittsburgh

Annual Meeting.—The Allegheny County Medical Society held its annual meeting at the Hotel Schenley, April 2. After demonstrations of allergic patients, Dr. William V. Mullin, Cleveland, discussed "Treatment of Sinus Disease, with Particular Reference to Allergy of the Upper Respiratory Tract." At the banquet in the evening Dr. Howard W. Haggard, associate professor of physiology, Yale University, made an address on "Medicine and the Public."

SOUTH CAROLINA

Bill Passed.—S. 204 has passed the senate and the house, proposing to amend the insurance law so as to authorize any ten or more persons to associate themselves together as a mutual protection association for the indemnifying of each other for losses on the assessment plan, and not for profit, "to insure the lives or health of . . . members against death or disability by accident or disease, or hospitalization benefits."

Special Meeting of House of Delegates.—The house of delegates of the South Carolina Medical Association held a special meeting in Columbia, March 5, to hear the report of delegates to the special meeting of the House of Delegates of the American Medical Association. The report of the reference committee at the Chicago meeting was unanimously endorsed and a committee was appointed to act in cooperation with the American Medical Association and committees from other state associations in the study of economic problems. The committee includes Drs. Robert S. Cathcart, Charleston; James W. Jervey, Greenville; Thomas A. Pitts, Columbia; Charles R. May, Bennettsville, and William R. Wallace, Chester.

State Medical Meeting in Florence.—The eighty-seventh annual session of the South Carolina Medical Association will be held in Florence, April 23-25. Invited guests will be Drs.

Henricus J. Stander, New York, who will speak on "Nephritis in Pregnancy"; William B. Castle, Boston, "Diagnosis and Treatment of Anemia and Certain Associated Deficiency Diseases," and Temple S. Fay, Philadelphia, "Head Injuries: Their Management and Treatment." South Carolina physicians listed on the preliminary program include:

Dr. James Richard Allison, Columbia, The Practical Management of Acne Vulgaris.
Dr. Kenneth M. Lynch, Charleston, Malignant Melanoma.
Dr. Lucius Emmett Madden, Columbia, Suppurative Pericarditis.
Dr. George T. Tyler Jr., Greenville, Subphrenic Abscess.
Dr. Olin B. Chamberlain, Charleston, Early Diagnosis of Chronic Arthritis.
Dr. Austin T. Moore, Columbia, Fracture of the Hip Joint (Intracapsular)—A New Method of Skeletal Fixation.

The South Carolina Public Health Association will hold its meeting April 23 and the woman's auxiliary, April 24.

WISCONSIN

Bill Introduced.—A. 593 proposes to make it the duty of the county board of supervisors of every county to provide medical, dental and hospital care and treatment for all persons receiving relief in the county and to set aside such funds as may be necessary to preserve the health of such persons.

Personal.—Dr. Charlotte J. Calvert, supervisor of the bureau of child welfare of the state board of health since 1929 and a member of the staff since 1925, retired to private life, March 1. ——Dr. John C. Wright, Antigo, was made honorary secretary of the Langlade County Medical Society on his retirement in February as active secretary after many years' service.

Fellowships for Research in Cancer.—Drs. Fred E. Mohs and Harold P. Rusch, Madison, have been appointed to research fellowships at the University of Wisconsin School of Medicine under the fund recently left to the university by Miss Jennie Bowman. A special committee is investigating the possibility of expanding cancer research at the university under the $450,000 bequest, which at present yields an income of $12,000 a year.

Society News.—Dr. Herman L. Kretschmer, Chicago, addressed the Milwaukee Roentgen Ray Society in Milwaukee, February 1, on "Roentgen-Ray Problems in Pediatric Urology." ——At a meeting of the Milwaukee Society of Clinical Surgery, February 25, speakers were Drs. Herman A. Heise, Milwaukee, on "Blood Transfusion in Emergency Surgery"; Ralph M. Waters, Madison, "Anesthesia in Emergency Cases," and Frederick A. Besley, Waukegan, Ill., "Treatment of Compound Fractures."——Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, addressed the Brown-Kewaunee-Door Counties Medical Society, Green Bay, February 9, on "Our Changing Times."

PUERTO RICO

Tuberculosis Clinic on Wheels.—The health department of Puerto Rico has had built a special 1½ ton Dodge truck for use in its tuberculosis service. There is a compartment containing the x-ray apparatus and a special cot for the patient while being photographed. In this compartment also are the developing tanks, which may be made light proof by means of special shutters, and storage space for photographic plates. In the rear of the truck are cabinets and drawers for storing medical supplies, a 30 gallon water tank and a sink. A motor driven fan supplies fresh air to both sections of the truck, and a special generator driven from the transmission take-off furnishes electric power for the x-ray machine.

GENERAL

Society News.—The American Heart Association will meet in Atlantic City June 11 and not June 6, as noted in THE JOURNAL, April 6.——The National Congress of Parents and Teachers will hold its annual meeting in Miami, Fla., April 29-May 3.——The American Urological Association will meet in San Francisco, June 25-28, in conjunction with the Western Branch Society.

Anatomists Meet in St. Louis.—The American Association of Anatomists will hold its fifty-first session at Washington University School of Medicine, St. Louis, April 18-20. Dr. Warren H. Lewis, Baltimore, will deliver his presidential address at the annual banquet at the Hotel Chase, Friday evening, April 19, on "Normal and Malignant Cells." A feature of the program will be a symposium on "The Relation of the Pituitary to Reproduction," presented by Aura E. Severinghaus, Ph.D., New York; Frederick L. Hisaw, Ph.D., Madison, Wis.; Carl R. Moore, Ph.D., Chicago, and Warren O. Nelson, Ph.D., Chicago.

Another Impostor.—A man using the name Maguire is reported to have called on physicians in several cities attempting to borrow money. Introducing himself as the brother-in-law of Dr. Winford H. Smith, director of the Johns Hopkins Hospital, Baltimore, he tells of an automobile accident and a fine that has taken all his cash. He asks for a small loan to enable him to reach home. He is described as being between 60 and 65 years of age, with thin light hair and eyes, and neatly dressed. A small wrinkle or scar runs downward and outward about an inch from the right side of the mouth. Several teeth are missing from his right lower jaw, leaving a conspicuous discolored canine tooth. He is said to have operated in Rochester, N. Y., Columbus, Ohio, and Montreal within the past year.

A Film to Instruct Mothers.—"Around the Clock with You and Your Baby" is the title of a motion picture to educate mothers in the care of the new-born, produced by the department of obstetrics and gynecology of the University of Southern California at Los Angeles, under the direction of Drs. Lyle G. McNeile and Donald G. Tollefson. The care and feeding of infants as it should be done in the average home, as well as advice for mothers' own health, is shown in detail. The film, 35 mm. in three reels, requires about thirty-five minutes to show. It may be lent without charge for an indefinite time to any ethical hospital, if shown at least twice a week and a report of the number of showings and the number of persons who viewed the film is forwarded once a month. Further information may be obtained by writing Dr. Tollefson, 511 South Bonnie Brae Street, Los Angeles.

Immigrant Physicians in 1934.—Records of the U. S. Bureau of Immigration show that during the fiscal year ended June 30, 1934, the United States admitted 353 immigrant aliens who gave their occupation as physician. Although the number of all immigrants has been reduced from 279,678 in 1929 to 29,470 in 1934, the number of physicians in 1934 was almost as great as that for 1929, 398. For the intervening years the numbers were 390 in 1930, 329 in 1931, 259 in 1932, and 187 in 1933. By far the greatest number (160) came from Germany in 1934 and the greatest number to settle in any one place remained in New York, 190. Among the group were 163 Jewish physicians. American consular officers abroad, who must determine in each case whether a prospective immigrant is admissible to the United States, may allow a physician to enter the United States in his professional capacity even if the quota restrictions are exhausted, but he is required to present proof that he has sufficient income and resources to keep him from becoming a public charge.

American College of Physicians.—The nineteenth annual clinical session of the American College of Physicians will be held in Philadelphia, April 29-May 3, with general headquarters at the Municipal Auditorium. A clinical program will make up the general sessions, to be held at eleven hospitals and some of the medical schools in the city. A departure this year is a series of morning lectures, which, according to the program, is presented as an elective, as a whole or for individual days in place of the hospital clinics. These lectures will be presented daily and will be devoted to four general topics: diseases of the bones and joints, neurology, bronchopulmonary diseases and endocrinology. The annual convocation will be held Wednesday evening, May 1, when the John Phillips Memorial Medal will be presented. Following the convocation ceremony, Dr. Leo Loeb, professor of pathology, Washington University School of Medicine, St. Louis, will speak on "The Thyroid-Stimulating Hormone of the Anterior Pituitary Gland," and Dr. Jonathan C. Meakins, Montreal, will deliver his presidential address. There will be a smoker, Monday evening, and the annual banquet will be held Thursday evening. On the latter occasion, Dr. Alfred Stengel, Philadelphia, will be toastmaster, and Hon. Roland S. Morris, president, American Philosophical Society, and ex-ambassador to Japan, will give an address on "The Present Unrest in the Far East." With special emphasis placed on clinics, the program this year gives a place to consideration of the fundamental aspects of physiology and biochemistry besides the more practical problems of medicine.

Medical Bills in Congress.—*Changes in Status:* H. R. 7260, introduced by Representative Doughton, North Carolina, April 4, and reported to the House, April 5, with recommendation that it pass, is a redraft of the so-called Wagner-Doughton-Lewis Social Security Bill. The redraft omits from its title all reference to "illness." The original social security bill proposed to establish a Social Insurance Board, which, among other things, was to be authorized to make recommendations with respect to health insurance. In the redraft of the bill the name of the board has been changed to "Social Security Board," and no duty devolves on the board to study and make recommendations specifically with respect to health insurance.

Corporations organized and operated exclusively for religious, charitable, scientific, literary or educational purposes, no part of the net earnings of which inures to the benefit of any private shareholder or individual, are not liable to the assessments provided in the redraft for old age or unemployment benefits, nor, apparently, are employees of such corporations to be entitled to such benefits. The redraft provides, as did the original bill, federal subsidies, contingent on state plans being acceptable to federal agencies, to promote maternal and infant welfare, to care for crippled or dependent children, to provide for child welfare services, and for the development of state and local health work. *Bills Introduced:* H. R. 7124, introduced (by request) by Representative Hennings, Missouri, proposes to authorize the erection of an addition to the existing veterans' facility at Jefferson Barracks, Missouri. H. R. 7130, introduced by Representative Nichols, Oklahoma, proposes to authorize the erection of additional facilities to the existing veterans' facility at Muskogee, Okla. H. R. 7134, introduced by Representative Utterback, Iowa, proposes to authorize the erection of an addition to the existing veterans' facility at Knoxville, Iowa. H. R. 7135, introduced by Representative Fulmer, South Carolina, proposes to authorize the erection of an addition to the existing veterans' facility at Columbia, S. C. H. R. 7156, introduced by Representative Scrugham, Nevada, and S. 2455, introduced by Senator McCarran, Nevada, propose to authorize the erection of a veterans' hospital in Nevada. H. R. 7163, introduced by Representative Fenerty, Pennsylvania, proposes to authorize the erection of an addition to the existing veterans' facility in the District of Columbia. H. R. 7169, introduced by Representative Church, Illinois, proposes to erect an addition to the existing veterans' facility at North Chicago, Ill. H. R. 7200, introduced by Representative Kinzer, Pennsylvania, proposes to erect an addition to the existing veterans' facility at Coatesville, Pa. H. R. 7232, introduced by Representative West, Texas, proposes to erect a veterans' hospital in Texas. H. R. 7234, introduced (by request) by Representative Christianson, Minnesota, proposes to authorize the erection of an addition to the existing veterans' facility at Minneapolis. H. R. 7261, introduced by Representative Carter, California, proposes to authorize the erection of an addition to the existing veterans' facility at Livermore, Calif.

FOREIGN

New Editor of Tuberculosis Journal. — Dr. Lancelot S. T. Burrell was recently appointed editor of the *British Journal of Tuberculosis* and various changes in the form of the publication have been made, beginning with the January issue. It will be the policy henceforth to emphasize the practical as opposed to the purely theoretical, according to an announcement. A department to be known as "Consultations" and another, "Problems in Applied Medicine," are now included in addition to original articles, society proceedings, abstracts and book reviews.

Chadwick Medal Awarded.—Col. William P. MacArthur, late of the Royal Army Medical Corps, received, February 18, the Chadwick Gold Medal and Prize of £100, awarded every five years to the medical officer of the navy, army or air force who has most distinguished himself during that period in promoting the health of the men of the service to which he belongs. Following the ceremony, the twenty-third annual series of Chadwick Lectures was inaugurated by W. A. Robson, barrister-at-law, with an address on the evolution of public health during the past hundred years.

Congress on Industrial Accidents.—The American delegation to the seventh International Congress on Industrial Accidents and Diseases to be held in Brussels, Belgium, July 22-27, will leave New York July 8 and will visit London, Amsterdam, The Hague, Paris, and optionally Budapest. Physicians interested in the congress or in the medical tour may receive information from the secretary for America, Dr. Richard Kovacs, 1100 Park Avenue, New York. Dr. Fred H. Albee, New York, is chairman of the American committee for the section on accidents and Dr. Emery R. Hayhurst, Columbus, Ohio, for industrial diseases.

CORRECTIONS

Antirachitic Cow's Milk.—In the article by Gerstenberger, Horesh, Van Horn, Krauss and Bethke in THE JOURNAL, March 9, the heading of table 6, on page 817, should have read: Comparative Vitamin D Potencies of Butter Fat from Y Milk and from L Milk (Curative Method).

Months Instead of Years.—On page 998 of the article by Dr. Novak in THE JOURNAL, March 23, the statement that Engelbach reported satisfactory growth results in a pituitary dwarf in whom treatment was carried out "for nine and a half years" should read "for nine and a half months."

Government Services

Increase of 6,264 Patients in Veterans' Hospitals

Continuous adjustments in benefits authorized to war veterans and their dependents were in process during the fiscal year ended June 30, 1934, according to the annual report of the Veterans' Administration. Changes brought about under the law enacted March 20, 1933, had been placed in operation when the statute of March 28, 1934, was enacted, restoring many of the provisions that had been in effect before the Economy Act. The Board of Veterans' Appeals, established Dec. 1, 1933, to review claims, had rendered decisions in 7,523 cases and had pending 7,358 at the end of the fiscal year. The total hospital load of the Veterans' Administration at the close of the year was 40,059, an increase of 6,264 over the previous year, largely the result of liberalization of the provisions of the Economy Act; the entire increase occurred in the group of patients with non-service connected disabilities. The report states that with the exception of 1932 this patient population is the highest recorded in any year since 1917, when hospitalization for World War veterans was first authorized. Classified according to service there were among the patients 35,754 veterans of the World War; 2,229, Spanish-American War; 194, Civil War; 97, other wars and expeditions, and 1,171, peace time service. Of the World War veterans only 11,799 were being treated for disabilities of service origin. Of all patients in the hospitals, 56 per cent were suffering from neuropsychiatric diseases, 13 per cent from tuberculosis and 31 per cent from general medical and surgical conditions. In June 1923 the percentages were respectively 39, 41 and 20. The number of hospital admissions during the year was 63,900, the lowest recorded since 1920. The drop was due to the law of March 20, 1933, which denied hospitalization for non-service connected disabilities of a temporary nature, operations of choice and similar conditions. During the last part of the year following the enactment of the more liberal law of March 1934 there was a material increase, it was said. Of the admissions, 42,475 were for general medical and surgical conditions, 8,889 for pulmonary tuberculosis, 5,695 for psychotic and mental diseases and 6,841 for other neuropsychiatric disorders. The total number of patients in the various hospitals during the year was 108,676, of whom 58,713 were discharged after an average of 122.1 inpatient days. Deaths totaled 5,334, of which 2,901 occurred among patients under treatment for general conditions, 1,660 for pulmonary tuberculosis, and 773 for neuropsychiatric diseases. Of those among general patients, more than 38 per cent were caused by diseases of the circulatory system and approximately 30 per cent by malignant tumors and diseases of the genito-urinary system. The veteran population under domiciliary care at the end of the fiscal year totaled 9,404, as compared with 11,187 the previous year. There were 8,305 admissions, of which 85 per cent were for non-service connected disabilities, and 9,806 discharges after an average period of five months' care. The total number of beds controlled by the Veterans' Administration in both hospital and domiciliary facilities June 30, 1934, was 66,839. Seven new facilities were opened with beds as follows: Fayetteville, Ark., 258; Des Moines, Iowa, 300; Wichita, Kan., 166; Biloxi, Miss., 207; Batavia, N. Y., 297; Roseburg, Ore., 191, and Cheyenne, Wyo., 108. Domiciliary facilities were opened at Biloxi and Roseburg, with 350 beds each. Since the end of the year under report, two facilities have been completed at San Francisco, 334 beds, and at Roanoke, Va., 472 beds. Plans were approved for conversion of the facility at Danville, Ill., into a neuropsychiatric hospital. The field facilities of the administration made 559,554 physical examinations for outpatient purposes, a decrease of 790,898 from the previous year. Treatments furnished totaled 575,816, as compared with 830,115 the previous year. As a result of the Economy Act of March 20, 1933, the number of emergency officers of the World War entitled to retirement pay was reduced from 6,304 to 1,595, the law having limited this benefit to those whose disabilities resulted directly from military or naval service. The net operating expense for all hospitals was $32,620,447.39, and for domiciliary facilities $3,648,607.60. The per diem cost of operation for hospitals was estimated to be $2.51, and for domiciliary facilities 97 cents. The actual net disbursements of the administration for all purposes during the year aggregated $594,022,058.08. At the end of the year there were 34,890 employees on the rolls, 5,210 in the central office and 29,770 at field stations, whose gross annual salaries amounted to $55,810,584.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 16, 1935.

The Aging of the English Population

Again the figures of the registrar general show that as a people the English are growing older as a result of the falling birth and death rates. The birth rate for 1934 was 14.8 per thousand of population. In the last thirty odd years the rate has been halved. This fall is without parallel in the history of this or any other country. The infant death rate in 1934 was 59 per thousand live births; in the quinquennium 1901-1905 it was 138. The general death rate has also been falling steadily. In the quinquennium 1901-1905 it was 16.1 per thousand of population; in 1934 it was 11.8, which was 0.4 above that for 1933, the lowest on record. The increasing aging of the population is shown by the proportion of the persons over the age of 70 years per 10,000 of the total. In 1911 they numbered 297; in 1921, 344; in 1931, 426 and in 1932, 434. The registrar general therefore describes the increase in the number of old people as "an outstanding feature of our vital statistics."

The Eradication of Rabies from Great Britain

Many years ago a courageous home secretary introduced, in the face of angry opposition from dog owners, the compulsory muzzling of all dogs. As rabies could not then be passed on from animal to animal, the disease became extinct after a time. But as rabies exists on the continent of Europe it would sooner or later be introduced by imported dogs when the muzzling period was over. This was prevented by a six months period of quarantine for all imported dogs, which is still in force. In the house of commons the minister for agriculture stated that five years has elapsed since the last case of rabies imported from Europe and four and three fourths from the rest of the world. He was asked whether he would reduce the period of quarantine. He would not do so, as experience had shown the six months to be necessary. Since 1919, twelve dogs imported from abroad have developed rabies while in quarantine, four of these between the fourth and the sixth month.

Escape from Wrecked Submarines

Great attention has been given by the admiralty to the problem of the escape from submarines, and a considerable advance has been made. Because of the successful use of the Davis escape apparatus, by which five men were rescued from the Poseidon in 1931, all submarines are furnished with escape apparatus, in the use of which the men of the submarine service are trained by means of a specially designed tank. A great improvement has been made on the earlier method. Each submarine is now provided with two escape chambers, which are built against the main bulkheads fore and aft and rise from the floor of the ship to the outer casing, through which a hatch opens directly into the sea. The escape chambers are in the main gangway and can be brought into use by closing water-tight doors, which give access to the adjacent compartments of the submarine. To ensure speed in case of emergency, all the controls of a chamber are triplicated.

In case of accident the procedure is for two men to enter the chamber wearing the Davis apparatus, which is a sort of diving dress, close the water-tight doors, flood the chamber with water from the sea, and, when the water has risen far enough, open the upper hatch and by rising through it escape to the surface. The hatch is then closed and the chamber emptied by draining the water from it into the bilges. Two other men enter the chamber and the procedure is repeated.

The escape chamber system has several advantages over the one that it has replaced, not the least being a much greater speed in operation. Two men can be sent to the surface every five minutes, while those waiting to escape do not have to stand in a flooded compartment with water up to their necks. For training purposes escape chambers have been constructed at the submarine depot, Portsmouth, where men are instructed. The course of instruction is thorough and includes practice in using the escape chambers and the Davis apparatus, methods of breathing under water to avoid caisson disease, and what to do after floating to the surface from a wrecked submarine. All the men in the submarine service are to go through a course of escape training yearly as a "refresher." For this purpose the admiralty has built a training tank at Hong-Kong and another at Malta.

PARIS

(From Our Regular Correspondent)

March 8, 1935.

Kidney Complications During Gold Treatment of Tuberculosis

At the Dec. 7, 1934, meeting of the Société médicale des hôpitaux, the subject of kidney complications during the gold treatment of pulmonary tuberculosis was discussed. Many tuberculosis specialists have been of the opinion that slight evidences of renal intolerance to gold salts, especially an albuminuria, ought not to be considered an indication for interrupting the treatment, because the albuminuria is only transitory and disappears spontaneously. This view is less favored at present than it was one or two years ago.

Bourgeois and his associates now report a case in which two previous series of treatments with the gold salts was accompanied by a slight albuminuria. Up to the time of beginning a third series, the patient had been given a total of 5.5 Gm. of gold. Two days after the disappearance of the albuminuria, just as the gold treatment was begun again, the patient presented all the clinical signs of an acute nephritis, with edema of the eyelids and both feet, oliguria, fever, dyspnea, delirium, ascites and gallop rhythm of the heart. These receded rapidly following treatment. There was now no albuminuria, however, and the blood urea rose only to 43 mg. per hundred cubic centimeters. Death occurred about six months later, following a severe hemoptysis. The kidneys showed the lesions of acute nephritis in the process of resolution. On chemical analysis, some of the renal tubules showed the presence of gold enclosed in the epithelium of these tubules. A total of 11.5 mg. of gold was found in the kidneys. Bourgeois and his associates state that one ought not to continue to employ the gold salts in pulmonary tuberculosis, whenever an albuminuria occurs. In the discussion, Etienne Bernard stated that doses (total) of as high as from 60 to 80 Gm. of the gold salts are tolerated without any accompanying albuminuria or rise in the blood urea. If renal complications occur, there must have existed some previous evidences of nephritis; hence one should search for these before beginning the gold treatment.

Justin-Besançon stated that, as the result of experimental study, an antidote had been found not only against acute intoxication due to the salts of gold but also to that of other toxic metals, including lead, mercury, uranium and bismuth. This antidote is sodium methyl sulphoxalate, which does not exhibit any toxic properties when injected into rabbits that have been given a lethal dose of sodium gold thiosulphate. This may prevent in the future any toxic effects of the gold salts.

Coste raised the question whether, in view of the case report of Bourgeois, one ought not to discontinue the gold treatment as soon as an albuminuria appears. One must consider the various diseases in which gold therapy is being employed.

Cases of chronic arthritis, which are usually very intolerant to the use of gold salts, rarely show any signs of nephritis even though a transitory albuminuria is observed. On the other hand, patients with pulmonary tuberculosis show evidences of nephritis from time to time, especially at the beginning of the gold treatment. One might think that polypeptide intoxication, which favors an amyloid degeneration of the kidneys, is followed by a special degree of "renal fragility." He would be far more inclined to discontinue the use of gold salts as soon as an albuminuria appeared.

In closing, Bourgeois said that the frequency of albuminuria in gold therapy is absolutely independent of the single or total dose. The renal complications should be placed in the same category as the ocular, blood and hemorrhage accidents. A search for a certain predisposition to renal complications had not thrown any light on the question. Of fifty-six cases that had shown slight evidence of renal lesions before the gold treatment had been begun, only one third had not shown renal complications. The other two thirds had shown all varieties of accidents due to the gold salts. Of eight cases of severe nephritis occurring during such therapy, four had previously shown evidences of nephritis. He would advise an estimation of the blood urea in every case before beginning the treatment.

Fatal Nephritis Following Gold Salt Injection

At the Dec. 21, 1934, meeting of the Société médicale des hôpitaux, Olmer and Sarradon reported a case in which a man, aged 37, entered the hospital with physical signs of a pulmonary tuberculosis involving the left apex and to a lesser extent of the base of the right lung. The sputum was positive for tubercle bacilli. The examination of the urine revealed nothing abnormal, especially no albumin or casts. The result of the blood urea examination, which proved to be 70 mg. per hundred cubic centimeters, was not known until the day following the first treatment. A single intramuscular injection of 0.05 Gm. of a gold salt was given. The following day the urine contained 9 Gm. per liter of albumin, but no casts. The albuminuria rose rapidly in amount during the next few days, and the blood urea increased to 300 mg. per hundred cubic centimeters. The patient died eight days after this single injection of the gold preparation, in uremic coma. No edema had ever been noted but there was a marked decrease in the urine output, only 250 cc. in twenty-four hours. The blood pressure never attained a level higher than 110 systolic and 70 diastolic. The only conclusion to be drawn is that the acute toxic nephritis was due to the gold treatment in a patient who had a renal intolerance for this metal. Although such accidents are infrequent, it teaches one that a complete examination, with every known renal function test, should be made before beginning a gold salt treatment. Unfortunately, in this case, the relatively high blood urea, 70 mg. per hundred cubic centimeters, was not reported from the laboratory until the day following the initial single and fatal dose.

Auric Nephritis and Amylosis

At the Dec. 21, 1934, meeting of the Société médicale des hôpitaux, Coste and associates reported the case of a man, aged 24, who entered the service of Prof. Leon Bernard with physical signs of pulmonary tuberculosis involving both lungs. Frequent examinations of the urine revealed nothing abnormal. Feb. 16, 1934, he was given 5 mg. of a gold salt. The following days, gradually increasing edema of the lower extremities, marked albuminuria and recurrence of a previously existing diarrhea were noted. The latter symptom increased in severity and was accompanied by headache, stupor, anorexia and occasional emesis. The blood pressure remained constantly between 100 and 110 systolic and 50 and 65 diastolic. The heart sounds became fainter and the somnolence increased until death, one month after the beginning of the gold salt therapy. The blood urea, from February 24 to March 3, had risen from 47 mg. to 86 mg. per hundred cubic centimeters. The total amount of the gold salts given was only 0.05 Gm. The necropsy revealed a large, pale liver with fatty infiltration but no amyloid changes, but in the kidneys there were extensive amyloid degenerative lesions of the glomeruli without evidences of changes indicative of an acute or chronic nephritis. The amyloid degeneration probably antedated the gold treatment, but no one can deny that the gold salt may not have precipitated acute amyloid changes, as reported by Dubrow.

Death Following Gold Treatment for Tuberculosis

At the January 18 meeting of the Société médicale des hôpitaux, Bourgeois and his associates added another fatal case following gold therapy for pulmonary tuberculosis. A man, aged 34, had a nonevolutive involvement of the right upper lobe. Injections of a gold salt were begun in April 1934. An urticaria of the trunk and arms followed the first injection of 0.05 Gm., so the doses were decreased to 0.025 Gm. given once a week. The last injection was given November 2, and the total up to that date was 5.4 Gm. of gold sodium thiosulphate. The last injection was followed by a papular eruption over the right shoulder and upper arm, as well as by a diffuse polyneuritis of motor paralysis type, which increased until a complete paraplegia was noted. Lumbar puncture did not throw any light on the etiology of the Landry syndrome (ascending paralysis). The patient died, November 17, with symptoms of asphyxia of bulbar origin. No exacerbation of the pulmonary lesions accompanied the polyneuritis; hence the authors feel that the gold salt alone was responsible. The urticaria following the first injection was already an evidence of intolerance to gold therapy. Such a sign has been observed by others but does not recur with the injection of gradually increasing amounts.

BERLIN

(From Our Regular Correspondent)

Feb. 18, 1935.

Health Insurance in 1933

Recent letters contained reports on the system of health insurance in vogue in Germany (THE JOURNAL, Nov. 10, 1934, p. 1463); also on the local krankenkassen, which include the great majority of the insured (THE JOURNAL, January 26, p. 331). In the meantime, the federal bureau of statistics has published further information on the year 1933.

The number of individual services rose in 1933 to almost 40,000,000 cases. About 4,000,000 more cases were treated in 1933 than in 1932. The main cause for this was the influenza epidemic of the spring of 1933. The number of cases of illness associated with incapacity for work was distinctly fewer. For each 4.5 cases there was one case with incapacity for work. The total number of such cases for the period 1929-1933 was as follows: 1929, 12,410,000; 1930, 8,653,000; 1931, 7,096,000; 1932, 5,357,000, and 1933, 6,083,000. It is evident, therefore, that the number of cases of illness with incapacity for work was in 1933 less than half that of 1929, although, by reason of the influenza, 1933 showed an increase over 1932. The average duration of the illness showed a tendency to increase: 1929, 25.8 days; 1930, 28.9 days; 1931, 29.8 days; 1932, 30.3 days, and 1933, 25.6 days. The reduction of the number of days in 1933 as against 1932 was also doubtless due to the influenza. The number of cases associated with incapacity for work was about the same in the two sexes, but the illnesses of the female members were of longer duration. The number of cases in which financial aid to puerperants was granted has shown a downward trend since 1928: 1928, 810,808; 1929, 802,656; 1930, 788,391; 1931, 686,743; 1932, 599,198, and 1933, 543,330.

The federal bureau of statistics regards this fact as an indication that the economic distress rested most heavily on the strata of the population that were insured in the health insurance associations (krankenkassen), the strata that, at the same time, contributed most to the preservation of the numerical status of the population. Likewise the number of death benefits has decreased from year to year: 1929, 243,108; 1930, 214,935; 1931, 200,082; 1932, 122,711, and 1933, 125,837. The increase in 1933 was only 2.4 per cent, although the total number of deaths in the German reich increased by 4.5 per cent. This smaller increase is due to the fact that, owing to the economic crisis chiefly, the older workmen in many instances have been deprived of their jobs and for that reason have gradually given up their health insurance. The total expenditure of the German krankenkassen dropped from 1,217,000,000 marks ($486,800,000) in 1932 to 1,180,900,000 marks ($472,360,000) in 1933. The expenditures for sick benefits likewise decreased in 1933. A comparison over the five-year period 1929-1933 follows: 1929, 1,740,500,000 marks; 1930, 1,523,800,000; 1931, 1,226,800,000; 1932, 857,900,000, and 1933, 835,400,000. Sick benefits provide for the treatment of patients by licensed physicians, dental treatment, medicines, hospital care, domiciliary care, house money, cash allowances, pocket money and financial aid for convalescents. The cash allowances ranged as follows: 1929, 684,000,000 marks; 1930, 509,000,000; 1931, 369,000,000; 1932, 220,000,000, and 1933, 201,000,000. The expenditures for cash allowances to patients have thus dropped since 1929 to less than one third. The same trend may be observed in the expenditures for medicines and for hospital care. Thus, the expenditures for medicines dropped from 237,800,000 marks in 1929 to 113,000,000 in 1933, and the expenditures for hospital care declined from 274,000,000 marks in 1929 to 176,000,000 in 1933. A similar decline was noted in the expenditures for medical care: 1929, 410,000,000 marks; 1930, 393,000,000; 1931, 328,000,000; 1932, 258,000,000, and 1933, 251,000,000. The administrative expenditures dropped from 130,000,000 marks in 1929 to 111,000,000 in 1933. The cost per member was 6.21 marks in 1929 and 6.13 marks in 1933. The receipts decreased even more than the expenditures. The receipts of the entire body of krankenkassen (except the ersatzkassen) amounted in 1929 to 2,109,000,000 marks; 1930, 1,922,000,000; 1931, 1,429,000,000; 1932, 1,078,000,000, and 1933, 1,031,000,000. The receipts thus fell off since 1929 by more than 1,000,000,000 marks. The dues per member were 97.90 marks in 1929 and 59.52 marks in 1933. In 1933 the highest receipts per member were reported by the marine krankenkasse (102.72 marks) and the miners' krankenkassen (94.27 marks). The lowest receipts were found in the rural krankenkassen (40.43 marks), which for a number of years have had the most difficult status of all the krankenkassen. The property holdings or net worth of the krankenkassen amounted in 1933 to more than 800,000,000 marks; the reserve funds increased from 408,300,000 marks to 436,400,000 marks. The reserve funds amount now to 30 per cent of the average annual expenditures during the previous three years (the minimal legal reserve is 25 per cent of the average expenditures of the previous three years).

The Saliva and Immunity to Diphtheria

The explanation given by Behring a number of years ago for diphtheria immunity (presence of a sufficiently large amount of antitoxin in the blood) does not hold good, as Professor Dold, hygienist of Tübingen, has pointed out, in face of the fact that there are animals which, in spite of marked parenteral (subepithelial) sensitiveness to diphtheria bacilli and their poison, and in spite of the absence of demonstrable quantities of diphtheria antitoxin in the blood, do not spontaneously contract pharyngeal or nasal diphtheria; nor can they be made to develop diphtheria by a massive experimental infection of the pharyngeal and nasal mucous membranes with virulent and toxic diphtheria bacilli. It is evident, therefore, that in these cases other protective mechanisms must be present. Of these, the protective action of the saliva and of the nasal secretion is doubtless the most important. Likewise the saliva of human beings (of adults and of the older school children) possesses such protective mechanisms capable of combating toxic diphtheria bacilli. It may serve to check their development; it may kill them after they have developed, or (in the event of long continued action) it may transform them into diphtheroids or into pseudo diphtheria bacilli, whereas the diphtheria toxin is not made inactive by human saliva. In establishing immunity to diphtheria and in connection with its origin and spread, this action of the saliva (presence or absence of these protective mechanisms) must be at least of equal importance with the antitoxin content of the blood; for, ahead of the antitoxic immunity of the blood, which constitutes, as it were, the second and last reserve force, the first line of defense is formed by the saliva or the nasal secretion, with the described antibacterial protective mechanisms. The therapeutic value of the antitoxin serum is, of course, in no wise affected by these observations.

Back-to-Nature Nutrition and Protein Metabolism

The subject of back-to-nature nutrition and protein metabolism was recently discussed by Professor Bickel before the Berlin Medical Society. In view of the tendency manifest in Germany to practice nature cures and to introduce the tenets of popular medicine into every possible field, a discussion of this kind was at this time peculiarly opportune. In primitive and civilized man, Bickel pointed out, a mixed form of nutrition, such as corresponds to the nature of man, has always been in the foreground. A one-sided nutrition, when found, is nearly always dependent on external influences or, in other words, is forced. An exclusive diet of raw foods cannot be regarded as a natural diet. For optimal nutrition, vegetable protein must always be supplemented by animal protein. In the experiments of Hindhede, with a limited nitrogen intake the nitrogen balance is preserved only by compensatory limitation of all combustion processes. Thereby the C : N quotient is abnormally increased and the quality of all oxidation processes is reduced. Bickel designated this as "dysoxidative carbonuria." It appears even when the nitrogen balance is still positive, and it increases when the nitrogen balance drops to the negative side. An increase of protein leaves the quotient normal and uninfluenced; hence natural nutrition does not require a strict limitation of the protein intake. Not all forms of protein are of equal value. The low and the average values are assignable to the vegetable proteins, and the high values to the animal proteins. If human beings or animals are nourished with proteins having only average or low values, such nutrition may be designated as of low quality, and the increase of body weight will be inadequate; there will be a defective resistance to infections; the nitrogen balance will be negative, and "dysoxidative carbonuria" will appear. If one feeds, for example, lentil protein, combined with amino-acids, an increase of the carbonuria will be brought about, even though large quantities of amino-acids are added to the diet. Addition of amino-acids to a mixed diet that is in itself adequate, or substitution of amino-acids for a portion of the nutritional protein, likewise leads generally to carbonuria.

The Health Record Book

In response to a request of the Amt für Volksgesundheit of the national-socialist party, a health record book comprising sanitary blanks for three periods of life has been issued; namely, for the period of infancy and the preschool age; for

the period of growth, from ages 6 to 18, and for the adult period from ages 19 to 65. The tasks of the Amt für Volksgesundheit lie chiefly in the field of health service, health education and health leadership and constitute a supplementation of the measures of the central government, which deal mainly with health building and health preservation. The Amt für Volksgesundheit intervenes more promptly, long before the central government can get into action. It acts also in those cases in which the functions of the health insurance system and the state have become exhausted. Its goal is to reach every person and to improve the health and the working capacity of every one, so far as possible, within the limits of his hereditary biologic and racial aptitudes. For that purpose it is necessary to observe a person in association with his family. Hence the examination of the family must be more emphasized, and the old type of house physician must again be cultivated.

Merger of German Neurologic Societies

The Gesellschaft Deutscher Nervenärzte and the Deutscher Verein der Psychiatrie have merged under the title "Gesellschaft Deutscher Neurologen und Psychiater," although each of the two resulting departments will retain a certain measure of independence. The psychiatric department will absorb also the Deutscher Verband für psychische Hygiene und Rassenhygiene. Professor Rüdin of Munich has been appointed "federal director."

ITALY

(From Our Regular Correspondent)

Jan. 31, 1935.

Congress of Occupational Medicine

The eleventh Congresso nazionale di medicina del lavoro was held recently in Turin. The first paper on the program, dealing with "Work on the Sea," was presented by Prof. Nicolò Castellino, occupant of the chair of occupational medicine (medicina del lavoro) at the University of Naples. He considered the diet of seamen, pointing out the present deficiencies and suggesting dietary tables calling for a greater consumption of protein substances and a diminution of carbohydrates, which are now used in excess. The author stressed the frequency of venereal diseases among seamen and proposed the adoption of prophylactic measures similar to those used in the army. The two disorders especially common in seamen are rheumatism and cardiovascular disturbances. Although rheumatism is caused by the nature of the surroundings in which the men are employed, in evaluating the relations between the organism and the disease it is necessary to take account also of the individual factor, for it is evident that every one has the type of rheumatism for which his organic peculiarities prepare the way. To explain the origin of cardiovascular diseases, the speaker stated that it is necessary to take account of the rapid changes in the weather and in the atmospheric pressure, of the fatigue poisons, and of the action that excessive perspiration exerts on the walls of the blood vessels. As seamen live in an atmosphere saturated with chlorides and iodine vapors, they commonly present physiologic hyperthyroidism. This observation should lead to the application of an energetic prophylaxis and to a more careful selection of men suitable to the calling. Diseases of the respiratory apparatus are next in order among those that attack seamen. In their causation humidity and fog are important causative factors, as they may constitute the vehicle of infectious microorganisms and harmful vapors. Congestive diseases of the pulmonary tree predominate, whereas tuberculous disorders are rare.

Professor Quarelli spoke on the subject "Work on the Sea and on Fresh Water Bodies," considering especially the diseases of fishermen. These may arise (1) from the excessive or the peculiar nature of the work, (2) from the environment, or (3) from the postures, compressions and motions involved in the work. Among the disorders referable to postures and to working positions, importance attaches to the erect or to the sitting posture that the fisherman must constantly assume in certain fishing places. Varices of the leg are frequent; also a certain amount of deviation and deformation of the dorsal portion of the spinal column in rowers and in those whose duty it is to draw in the nets to the shore. Among the disorders of compression may be mentioned the marked hollowing out of the right subclavicular fossa in boatmen, dyskinesia and cramps. Among the types of disease due to the environment, the speaker mentioned certain endemico-infectious disorders; those ascribable to the necessity of living exclusively on the fruits of fishing in some localities, scabious or purulent dermatosis, injuries due to inoculations of poison by fish and Coelentera, and malaria among those who work in localities in which anophelism is endemic.

Professor Micheli, senator, director of the Clinica medica in Turin, took as his subject "Exogenic Superinfection in Relation to the Question of Occupational Tuberculosis." The question has been in the foreground for several years but is still unsettled, being connected, on the one hand, with the question as to whether or not pulmonary tuberculosis that develops in persons employed in the aid of tuberculous patients may be regarded as an occupational disease, and, on the other hand, with subjects of scientific and practical interest, such as phthisiogenesis and prophylaxis. The author shares the opinions of the school that holds that so-called tuberculosis of adults has an endogenic origin. He is led to this conception by arguments of various nature, as the frequency of bacillemia, and the presence of live and vital germs in the tracheobronchial glands even when they are calcified, from which the germs themselves easily enter the blood stream. Modern theories on immunity affirm that, while the organism may be capable of overcoming readily the first tuberculous infection, it does not succeed in destroying the germs that the infection brought into the organism, for such germs remain alive even in the cicatricial processes of calcification. "Early infiltration," according to the speaker, is the expression of the exacerbation of small preexisting foci, surrounded by an area of exudative inflammation.

Professor Ranelletti of Rome spoke on poisoning due to carbon disulphide, pointing out that in such cases the principal morbid manifestations concern the nervous system. These present themselves in the form of a psychosis of a maniacal, confusional or demential type; polyneuritis that involves all four limbs. The localizations of polyneuritis may affect also the nerves and the flexor muscles. This is an important characteristic for the differential diagnosis as against pleuritis of a different nature.

Dr. Ando-Gianotti considered the neurovegetative and endocrine changes that are observed in poisoning due to carbon disulphide, with especial reference to the adrenal capsules. He concluded that under such conditions there are a special state of lability of the parasympathetic system and evident endocrine changes that affect particularly the genitalia, the islands of Langerhans, and the adrenal cortex.

Dr. Di Donna spoke on the hygienic prevention of sulphocarbonism, a question that is today important owing to the wide industrial use of carbon disulphide. Prophylaxis may be accomplished either by preventing the gas from spreading into the work rooms or by having the workmen put on gas masks and protective garments.

As the last official speaker, Professor Guglianetti described the injuries that result to the eye through overuse and constitute eye strain. One of the most typical occupational dis-

eases is the nystagmus of miners. Among the diseases due to the environment of the workman may be mentioned those produced by defective light or by radiations, such as cataract in men working near hot fires and in glass blowers, and the eye lesions due to roentgen rays. Also in association with caisson disease there are eye changes, and disorders of the visual apparatus may be due to the direct action of gas, vapors or dust contained in the air of the workman's environment or to the action of war gases.

Holstein spoke on the intoxication states due to mercury, which are observed in some hat factories. Vigliani referred to disturbances in workmen who apply spray varnishes to automobile bodies, pointing out that the digestive apparatus is most commonly affected, together with liver involvement. The changes in the blood were the least marked.

Naples was chosen as the meeting place for the next congress. The following subjects will be discussed: (1) pathology and hygiene of noises, (2) insurance against occupational diseases, after three years' trial, and (3) occupational poisonings due to the use of new chemical products.

VIENNA

(From Our Regular Correspondent)

Feb. 9, 1935.

Results of the Operation for Gallstones

At one of the recent sessions of the Vienna Medical Society, Prof. Dr. Finsterer discussed the results of the operation for gallstones. In order to judge correctly the results secured, not only the immediate results of the operation but also the permanent results must be considered. The early operation (under age 40), as recommended by Enderllen and Hotz, is still rejected by many internists, which Professor Finsterer regards as an error; for the mortality of the interval operation, and also of the early operation in an acute attack, associated with fever, in patients under 40 years of age, is lower than in patients from 50 to 60 years old. Finsterer reported that in his own series of cases he had only two deaths in 136 interval operations, and no deaths in thirty-nine cholecystectomies performed in the acute stage in patients under 40. The speaker stated, however, that in the interval operation the age of the patient, in his opinion, is not important. In thirty-nine patients whose ages ranged from 60 to 79 he had but one death. In his own series of cases the age was of slight importance in the acute stage. In the 40-50 age group all his twenty-nine cases ended in recovery; in the 50-60 age group the mortality was 9 per cent in thirty-one cases; but in the 60-70 age group only 5 per cent in a series of nineteen patients; in seven patients more than 70 years old, with gangrene of the gallbladder, the mortality rose to 28 per cent. The early operation in an acute febrile attack (within forty-eight hours after the beginning of the attack) gave good results (forty-six cases with 2 per cent mortality), whereas the late operation in a series of seventy-nine cases gave more than 6 per cent mortality. Hence the early operation is safer than a waiting policy. It may be observed that cholecystectomy gives better results than cholecystostomy (118 cases with three deaths as against seven cases with three deaths). These figures agree closely with the experiences of many other operators. But if the patients are not brought to the physician until necrosis of the pancreas or perforation peritonitis has developed, the operation is, to be sure, still indicated, but the results are then poor (sixteen deaths in eighteen cases). In stone of the choledochus the prognosis depends on the degree and the duration of the obstruction but also on the operation. The results are excellent in simultaneous cholecystectomy and supraduodenal choledochoduodenostomy (seventy cases with 7 per cent mortality), particularly in elderly persons (twenty cases with 5 per cent mortality). Aged patients, more than 70 years old, reacted surprisingly well, all six cases ending in recovery. The results of choledochus suture are not so good (eleven cases with one death), and very bad in hepaticus drainage (eighteen cases with more than 22 per cent mortality). It is important that the anastomosis be planned on generous lines, in order that, immediately after the operation, all the bile may again enter the intestine. Finsterer designates as an acute attack only the febrile attack with a temperature of at least 38 C. (100.4 F.). In such cases, because of the possibility of a later complication, it is better not to delay the operation long. For the intervention he does not use general (ether) anesthesia but only paravertebral or splanchnicus anesthesia. To this fact he ascribes his good results in aged patients. The total elimination of ether does away with postoperative pneumonia and the damage to the liver. In his own series of ninety-three cases in which the patients were more than 60 years of age, pneumonia was entirely absent.

The permanent results were remarkably good in cholecystectomy in the acute febrile stage; for, of seventy cases in which the operation dates back from three to twenty years, 91 per cent (sixty-four patients) are free from symptoms. In this series four patients have a slight hyperacidity, and only two patients complain again of symptoms. In one case, in a supplementary operation no stones but a cholangeitis was found. A second patient had a duodenal ulcer. A recent gastric resection brought permanent freedom from pain (sixteen years after the original operation). In the interval operation the results are not so good; for of 178 patients only 142 are free from pain (80 per cent). Twelve patients have at times slight symptoms but have regained their complete working capacity. Twenty-four patients, however, have at times rather severe symptoms, but in only two cases is the pain ascribable to cholangeitis; in the other cases various causes are responsible (ulcer, colitis). In chronic cholangeitis without stones the results are poor (of thirty-four patients only 66 per cent were cured, while in 17 per cent no cure was effected). In stone of the choledochus the permanent results after hepaticus drainage or suture of the choledochus are not satisfactory (of thirteen patients only five recovered, while three died). On the other hand, the permanent results of choledochoduodenostomy were very good (of forty-two patients, thirty-seven, or 88 per cent, have been well for periods ranging from three to twelve years; three have slight symptoms, and only two remained uncured). The charge that this operation incurs a danger of an ascending infection is unfounded. Finsterer presented several patients who had undergone this intervention with success. The precondition of a permanent result is that the anastomosis shall remain wide open; hence a longitudinal incision along the choledochus and likewise along the duodenum must be made. The bad results are due, in 50 per cent of the cases, to a duodenal ulcer, whereas cholangeitis is present in only about 25 per cent of all cases, or 4 per cent of the operations. A comparison with the sparse statistics on cases treated by internists reveals that, even with institution of a strict diet, in only 40 to 50 per cent was a reasonably permanent freedom from symptoms effected, and that from 16 to 25 per cent died without operation from their gallstone disease, or, because of a dangerous complication, were operated on a second time, whereas in the operations, including all complications, a mortality of from 4.5 to 6.5 per cent was recorded. In 87 per cent, however, complete recovery, extending in some cases over a period of twenty years, was secured. The other cases showed a 4 per cent incidence of persistent cholangeitis. The remaining patients suffered from a duodenal ulcer, colitis, renal stone, and the like. The results of operation are thus much better than those of internal treatment; but with the cooperation of the internist they might be still better, if the value of the early operation in the younger years and also the value of the early operation in the acute febrile stage become more generally recognized; and if the

surgeon during the intervention, even in the presence of stone, will look carefully for concomitant disorders, particularly duodenal ulcer, and will treat also these operatively.

During the discussion following the presentation of the paper, it was apparent that a large majority of the surgeons agreed, to a great extent, with the statements of the speaker. Prof. Dr. Ewald remarked that the question of early operation in gallstone disease reminded him of a similar discussion, thirty-five years ago, on the problem of early operation in appendicitis. This question, also, was answered in favor of the radical point of view. Professor Moszkowicz uttered an interesting warning against a surgical intervention immediately after a roentgen examination. The agents used in connection with a roentgen examination are not indifferent to the organism; hence from six to eight days should intervene between a roentgen examination and an operation.

Suicide Statistics for 1934

A compilation of the suicides for 1934 (including unsuccessful attempts) has just been published and gives a good insight into conditions in Vienna in recent years. From these statistics it appears that since 1930 the number of persons weary of life's struggle has been decreasing. Whereas in 1930 the number was 3,065 and in 1933 still 2,825, it dropped last year to 2,507, 1,219 men and 1,288 women. The number of successful attempts was 1,019 (592 men and 427 women). Nearly all age groups were represented, from a 10-year-old boy to an 83-year-old woman. The most important causes for the attempt were economic distress and unemployment, 413 cases; family quarrels, 366; sickness, 344; mental disturbance, 182; unfavorable physical conditions, 169; unhappy love affairs, 165; fear of punishment, 67, and grief over the death of near relatives or friends, 51. The cause remained unexplained in 745 cases. Both sexes showed a predilection for poison; considerably more than half of the suicides were accomplished by means of illuminating gas (544); 225 preferred death by hanging; 98 used firearms; 78 persons sought death by leaping from great heights; 52 by drowning; 9 by the use of a chopping or cutting weapon; 12 persons voluntarily allowed themselves to be run over, and one man chose a death by burning. It is interesting to note that in the winter months the number of suicides (498) was distinctly fewer than in summer (521). In the months of March, April and May, more than 100 suicides were recorded; in September and December only 70 each. The number of attempted suicides among the women was much greater than among the men.

Marriages

ROBERT PARK JR., Beaver Falls, Pa., to Miss Marjorie Lee Sprye of High Point, N. C., in Brooklyn, February 16.

ANGUS C. MEAGHER, Toppenish, Wash., to Miss Glenna Lee Pratt of Yakima at Butte, Mont., Dec. 29, 1934.

HENRY SHIRLEY MILLETT, Brooklyn, to Miss Annie Ostrom Alexander of New York, February 11.

HOMER A. WHITTINGTON, Natchez, Miss., to Miss Elizabeth Wood of Brookhaven, February 5.

PAUL A. BREHM, Milwaukee, to Miss Mary Elizabeth Harrison of New York, January 21.

SIGMOND J. SHAPIRO, Warren, Ohio, to Miss Ruth E. Leopold of Youngstown, March 13.

HERBERT S. RAINES to Miss Margaret P. Swartz, both of Philadelphia, March 4.

ALEXANDER L. STEARNS to Miss Elizabeth J. Day, both of Chicago, March 24.

AMERICO FERLITA to Miss Nina Tagliarini, both of Tampa, Fla., February 28.

KELLIE N. JOSEPH, Decatur, Ala., to Miss Dell Ivie of Alto, Ga., March 23.

Deaths

Edgar Moore Green ⊕ Easton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1886; past president of the Northampton County Medical Society; fellow of the American College of Physicians; formerly member of the state board of medical education and licensure; at one time member and president of the board of education; internist on the consulting staff of St. Luke's Hospital, Bethlehem; life member of the board of trustees of Lafayette College; aged 72; died, March 9, of arteriosclerosis.

Thomas Cook Stellwagen ⊕ Philadelphia; Jefferson Medical College of Philadelphia, 1903; professor of genito-urinary surgery at his alma mater; member of the American Urological Association; member and past president of the American Association of Genito-Urinary Surgeons; served during the World War; aged 55; at various times on the staffs of the Philadelphia General Hospital, St. Joseph's Hospital, Jewish Hospital and the Jefferson Hospital, where he died, March 15, of angina pectoris.

Mary Gage Day ⊕ Kingston, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; member of the Associated Anesthetists of the United States and Canada; on the staff of the Benedictine Hospital; on the staff and member of the board of managers of the Ulster County Tuberculosis Hospital and member of the courtesy staff of the Kingston City Hospital; aged 77; died, March 7, in St. Petersburg, Fla., of injuries received in an automobile accident.

Harold Gould Garwood, Denver; Johns Hopkins University School of Medicine, Baltimore, 1904; fellow of the American College of Surgeons; served during the World War; formerly instructor in surgery, University of Colorado School of Medicine; at various times on the staffs of the Colorado General, Denver General, St. Luke's and Children's hospitals; aged 59; died, March 8, in the Station Hospital, United States Army, Fort Sill, Okla., of lobar pneumonia.

Colman Ward Cutler ⊕ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889; member of the board of directors of the National Society for the Prevention of Blindness; aged 72; at various times on the staffs of the New York Hospital, Woman's Hospital, St. Mary's Hospital for Children and St. Luke's Hospital, where he died, March 17, of arteriosclerotic heart disease and cerebral hemorrhage.

Thomas McKean Thompson McKennan ⊕ Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1882; professor of neurology, University of Pittsburgh School of Medicine; member of the American Neurological Association and the Association for Research in Nervous and Mental Disease; aged 75; neurologist to St. Francis Hospital, where he died, February 16, of lobar pneumonia.

William Egleston, Hartsville, S. C.; University of Nashville (Tenn.) Medical Department, 1898; member and president of the South Carolina Medical Association; past president and secretary of the Darlington County Medical Society; chairman of the South Carolina State Board of Health; served during the World War; aged 61; died, March 24, of cerebral thrombosis.

Henry William Kice ⊕ Dover, N. J.; University of the City of New York Medical Department, 1888; at one time secretary of the Union County Medical Society; formerly mayor, member of the board of health and board of education and medical inspector of the public schools of Wharton; aged 74; died, March 6, of arteriosclerosis and carcinoma of the prostate.

Joseph Taylor Griest, St. Louis; Barnes Medical College, St. Louis, 1909; member of the Missouri State Medical Association; formerly professor of chemistry and toxicology at his alma mater and professor of toxicology and clinical medicine, National University of Arts and Sciences Medical Department; aged 55; died, March 2, of bronchopneumonia.

Charles Fletcher Milligan ⊕ Clayton, N. M.; University Medical College of Kansas City, 1906; president of the New Mexico Medical Society; secretary and past president of the Union County Medical Society; on the staff of St. Joseph Hospital; aged 55; died suddenly, February 2, of epidemic (lethargic) encephalitis.

Theodore Engelbach ⊕ Grand Isle, La.; Tulane University of Louisiana Medical Department, New Orleans, 1894; also a pharmacist; acting assistant surgeon, U. S. Public Health Service; deputy coroner and justice of the peace; aged 78; died, February 26, of acute pyelonephritis and bilateral bronchopneumonia.

John **Martin Birkner,** Lincoln, Neb.; Missouri Medical College, St. Louis, 1886; at one time professor of military surgery and clinical surgery, Nebraska College of Medicine; served during the World War; on the staff of St. Elizabeth's Hospital; aged 78; died, February 24, in a local hospital, of hypostatic pneumonia.

Louis W. Dean, Utica, N. Y.; New York Homeopathic Medical College and Hospital, 1890; fellow of the American College of Surgeons; formerly on the staffs of the Utica General and Utica Homeopathic hospitals; aged 76; died suddenly, March 2, in Charlottesville, Va., of heart disease and arteriosclerosis.

Jacob F. Hultgen ⊕ Chicago; Northwestern University Medical School, Chicago, 1900; formerly professor of clinical medicine, Loyola University School of Medicine; veteran of the Spanish-American War; on the staff of the Evangelical Hospital; aged 62; died, March 12, of carcinoma of the prostate.

John Garrett Wilson, Perth Amboy, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1876; member of the Medical Society of New Jersey; for many years on the staff of the Perth Amboy General Hospital; aged 82; died, March 9, of arteriosclerosis and pulmonary edema.

Hugo Christian Herman Schroeder ⊕ Granite City, Ill.; Hahnemann Medical College and Hospital, Chicago, 1909; past president of the Madison County Medical Society; on the staff of St. Elizabeth's Hospital; aged 49; died, February 25, in the De Paul Hospital, St. Louis, of heart disease.

Millard Winfield Baysinger, Chicago; Missouri Medical College, St. Louis, 1883; University of the City of New York Medical Department, 1891; aged 77; died, February 24, of hypertension, chronic nephritis and uremia.

Charles Haddon Spurgeon, Terre Haute, Ind.; Indiana University School of Medicine, Indianapolis, 1923; member of the Indiana State Medical Association; on the staff of the Union Hospital; aged 54; died, February 22, of coronary thrombosis.

Arthur Aratoon Basil, Johnstown, Pa.; Jefferson Medical College of Philadelphia, 1908; member of the Medical Society of the State of Pennsylvania; served during the World War; aged 54; died, February 25, of arteriosclerosis and chronic nephritis.

Cephas C. Greiner, Pemberville, Ohio; Chicago Homeopathic Medical College, 1896; member of the Ohio State Medical Association; aged 71; died, February 23, in the Community Hospital, Fremont, of injuries received in an automobile accident.

John Love Davis, Watertown, Tenn.; Vanderbilt University School of Medicine, Nashville, 1893; member of the Tennessee State Medical Association; for many years health officer of Watertown; aged 69; died, February 22, of cerebral sclerosis.

Frank M. McClelland, Franklin, Pa.; Western Reserve University Medical Department, Cleveland, 1887; member of the Medical Society of the State of Pennsylvania; aged 75; died, February 4, at his home in Utica, of heart disease.

Harvey S. Smith ⊕ East St. Louis, Ill.; Marion-Sims College of Medicine, St. Louis, 1899; past president of St. Clair County Medical Society; formerly member of the board of education; aged 60; died, February 13, of heart disease.

Victor Lyall Goodwill, Charlottetown, P. E. I., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1899; member of the American Psychiatric Association; aged 60; died, February 26, of coronary thrombosis.

Malcolm Lamson McInnes, Toledo, Ohio; Loyola University School of Medicine, Chicago, 1931; aged 32; on the staffs of the Flower Hospital and the Mercy Hospital, where he died, January 27, of tuberculosis.

Edward A. Stierberger ⊕ Union, Mo.; Marion-Sims College of Medicine, St. Louis, 1897; president and formerly secretary of the Franklin County Medical Society; aged 59; died, February 20, of heart disease.

Arthur McKendree Frost, Mount Vernon, Ill.; Physio-Medical College of Indiana, Indianapolis, 1888; aged 74; died, February 1, in the Anna (Ill.) State Hospital, as the result of a cerebral hemorrhage.

Joseph Croshor Boggs, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1890; served during the World War; aged 67; died, February 21, in San Antonio, Texas, of coronary occlusion.

Eleanor Alice Tebeau, Howard, R. I.; Tufts College Medical School, Boston, 1932; assistant physician to the State Infirmary; aged 29; died, Dec. 20, 1934, in Cranston, of intestinal obstruction.

Myron H. Williams, Mango, Fla.; Medical College of Ohio, Cincinnati, 1879; aged 80; died, February 24, in the Methodist Hospital, Indianapolis, of prostatic hypertrophy and arteriosclerosis.

Louis Valmore Masse, Warren, Ont., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1894; aged 61; died, January 25, of pleurisy.

George Andrew Stock, Outwood, Ky.; Jefferson Medical College of Philadelphia, 1898; on the staff of the Veterans' Administration Facility; aged 58; died, February 2, of uremia and nephritis.

Edmund Felix Taake, Seattle; St. Louis University School of Medicine, 1905; member of the Washington State Medical Association; aged 59; died, February 8, of carcinoma of the pancreas.

Ira E. Parker, Dryden, Mich.; Detroit College of Medicine, 1885; member of the Michigan State Medical Society; aged 74; died suddenly, in February, at St. Petersburg, Fla., of heart disease.

Leslie Montague Winn, Fulton, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1891; aged 67; died, March 4, of cerebral hemorrhage.

William S. Gregory, St. Joseph, Mo.; Northwestern Medical College, St. Joseph, 1893; Central Medical College of St. Joseph, 1896; aged 85; died, January 29, of prostatectomy.

John Milton Sims, Macedonia, Ill.; St. Louis College of Physicians and Surgeons, 1895; member of the Illinois State Medical Society; aged 75; died, March 2, of heart disease.

Agnes Virginia Fuller, Chicago; Hahnemann Medical College and Hospital, Chicago, 1902; aged 72; died suddenly, March 7, of cerebral hemorrhage and diabetes mellitus.

Henry William Clausen, St. Louis; Barnes Medical College, St. Louis, 1894; aged 72; died, February 22, in the Firmin Desloge Hospital, of adenocarcinoma of the rectum.

John C. Derbofen ⊕ New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1899; aged 63; died, January 11, of influenza and heart disease.

Edmond Alfred Genereux, New York; Harvard University Medical School, Boston, 1915; served during the World War; aged 46; died, March 3, of heart disease.

Temple K. Brown, Portland, Mich.; Detroit College of Medicine, 1907; aged 55; died, February 26, in St. Lawrence Hospital, Lansing, of rupture of the pancreas.

Robert Lee Boyd ⊕ Russellville, Ky.; University of Louisville Medical Department, 1890; aged 70; died, February 26, of diabetes mellitus and cerebral hemorrhage.

Perryman F. Page Jr., Taft, Calif.; Vanderbilt University School of Medicine, Nashville, Tenn., 1909; aged 55; died, January 14, in Bakersfield, of acute myelitis.

Isaac Walter Hodgens, Pottsville, Pa.; Jefferson Medical College of Philadelphia, 1894; aged 64; was found dead in his office, March 8, of heart disease.

J. W. Weber, Lewisville, Ohio; Starling Medical College, Columbus, 1882; formerly county health officer; aged 75; died, March 9, of coronary occlusion.

Stephen Francis Donovan, Derby, Conn.; College of Physicians and Surgeons, Baltimore, 1902; aged 55; died, February 21, of heart disease.

Truitt H. Nelson, Alamo, Ga.; University of the South Medical Department, Sewanee, Tenn., 1906; aged 52; died, February 3, of heart disease.

Dominic John Gardetto, Milwaukee; Marquette University School of Medicine, Milwaukee, 1921; aged 39; died, March 5, of injuries received in a fall.

Harry Jackson Knapp, Perryville, Mo.; St. Louis College of Physicians and Surgeons, 1901; aged 68; died recently, of carcinoma of the stomach.

Charles R. Davis, Baltimore; University of Maryland School of Medicine, Baltimore, 1890; aged 76; died, January 16, of chronic nephritis.

W. J. Walker, Tiptonville, Tenn. (licensed in Tennessee in 1889); aged 71; died, Dec. 17, 1934, in Dyersburg, of heart disease.

John H. Durham, Durant, Okla.; Hospital College of Medicine, Louisville, Ky., 1898; aged 62; died recently, of pneumonia.

William R. Edwards, Roscoe, Ga.; Southern Medical College, Atlanta, 1891; aged 74; died, March 4, of pneumonia.

Richard L. Falley, Bible Grove, Ill.; St. Paul Medical College, 1886; aged 75; died, February 26, of heart disease.

Correspondence

COD LIVER OIL

To the Editor:—I have just read the editorials in THE JOURNAL, March 16 and 23, entitled "Cod Liver Oil" (p. 926) and "Variations in Behavior of Vitamin D" (p. 1008). Each of these articles makes prominent reference to the recent publication from this laboratory, in which a physiologic difference between the vitamin D of cod liver oil and the vitamin D of bluefin tuna liver oil was demonstrated. Unfortunately, there is an error in each of these editorial interpretations, to which attention should be called.

The first editorial states that "perhaps the most striking support for the peculiar efficacy of cod liver oil has been recently brought forward by Bills, Massengale and Imboden, who found that blue fin tuna liver oil with 40,000 units of vitamin D per gram was only one sixth as effective when assayed with chicks as was cod liver oil with only 100 units of vitamin D per gram." The second editorial, in discussing the viosterol-cod liver oil anomaly, says: "A still more striking instance of discrepancy between these two widely used sources of the antirachitic factor has been cited by Bills, Massengale and Imboden. They compared cod liver oil with about 100 units per gram with blue fin tuna liver oil with 40,000 units per gram (both oils assayed with rats) on the basis of the behavior in chicks; the blue fin tuna oil was only a sixth as effective as was the cod liver oil."

The wrong impression which a reader of these editorials would get is that a given quantity of bluefin tuna liver oil, despite its relatively enormous potency when assayed with rats, is but one-sixth as effective for chicks as is the same quantity of cod liver oil. Our published work states most explicitly (and repeatedly) that the comparison was made on a "rat unit for rat unit" basis. Thus, while it is true that one rat unit of bluefin tuna liver oil is only about one-sixth as effective for chickens as is one rat unit of cod liver oil, it is also true that one gram or one drop of bluefin tuna liver oil is many times more effective for chickens than is one gram or one drop of cod liver oil, the reason for this being that the former contains a vastly greater unitage per gram than the latter. Applying the necessary arithmetic, one finds that the bluefin tuna liver oil, which is 400 times as potent as cod liver oil in vitamin D for the rat, is one sixth of 400, or 66⅔ times, as potent, gram for gram, for the chicken.

It is no simple matter to keep one's thoughts straight when considering the distinctions between the several forms of vitamin D. One is never justified in saying that one form is more, or less, potent than another, unless one makes the species comparison clear. For instance, in the present case, if the species employed for standardization of the oils had been the chicken, and the species for comparison had been the rat, it would have resulted that, chicken unit for chicken unit, bluefin tuna liver oil is six times more effective than cod liver oil for the rat. The same argument, of course, applies to comparisons of viosterol and cod liver oil, in which the species difference is even greater than between the two fish oils.

It may not be amiss to emphasize at this point what I have already indicated in my recent monograph in *Physiological Reviews,* namely, that the human infant resembles the rat much more closely than it resembles the chicken as regards its response to different kinds of vitamin D. If the reverse were true, the chicken rather than the rat would be the animal of choice in making assays of such products as viosterol and bluefin tuna liver oil when these agents were intended for human medication.

A second, minor error appears in the editorial of March 23, in which the first sentence in which our paper is mentioned leads the reader to think that our present work is "a still more striking instance of the discrepancy between these two widely used sources of the antirachitic factor" (referring to cod liver oil and viosterol). If our work is a striking instance of anything, it is of the multiple nature of vitamin D, but surely the present paper had nothing to do with viosterol.

CHARLES E. BILLS,
Research Laboratory,
Mead Johnson & Co.,
Evansville, Ind.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

USE OF TETANUS ANTITOXIN

To the Editor:—I am anxious to find out: 1. What is the difference in the value of the intravenous and intraspinal injections of tetanus antitoxin? 2. If it is injected into the spinal canal, will it not quicker neutralize the toxins attached to the nerve cells than in the intravenous route? 3. Are not the toxins liberated by the tetanus bacillus carried to the nerve cells of the cord almost wholly by the lymphatic system and not by the blood stream? 4. Is it considered that there is much more danger to the patient by intraspinal than by intravenous injections, and is it common to have a temperature of from 105 to 107 follow intraspinal injections of from 20,000 to 30,000 units? 5. When the antitoxin is injected into the canal, how is it taken up in the cord in order to neutralize the toxins attached to the nerve cells? 6. How much antitoxin in a tetanus patient should one usually inject? How often repeat, and for what number of days? 7. If a desensitizing dose should give the patient a reaction in an active case of tetanus, how should one proceed? If you are unable to answer all these questions for me, could you give me any information where I can get the latest writings on tetanus, or the addresses of any medical men who have written recent papers on this subject?

M.D., Illinois.

ANSWER.—1 and 2. It is not known whether the intravenous or the intraspinal injection of tetanus antitoxin is the more effective or whether the antitoxin reaches the affected nerve cells, if at all, sooner if it is injected intraspinally. Indeed, there is grave doubt whether the antitoxin can neutralize the toxin after it has united with the nerve cell.

3. It has been thought that tetanus toxin does not reach the nerve cells by way of the blood but by way of the axis cylinder of motor nerves. Recently Abel (*Science* **79**:63 [Jan. 26], 121 [Feb. 9] 1934), from reexamination of the evidence and from the results of his own investigations, has concluded that tetanus toxin reaches the central nervous system only by way of the arterial blood. It would be difficult to explain how the toxin could reach the nerve centers from the peripheral parts of the body by the way of the lymphatic system.

4. The intraspinal injection of appropriate amounts of antitoxin is not regarded as more dangerous to the patient than the intravenous injection. The amount of the intraspinal injection is governed by the amount of cerebrospinal fluid withdrawn beforehand. The number of antitoxic units introduced with each intraspinal injection will depend on the antitoxic strength of the serum. It does not seem to be a common experience that the temperature rises after intraspinal injection.

5. It is not known just what happens with the antitoxin after it is injected into the spinal canal. Probably most of it is absorbed into the blood.

6 and 7. In treating tetanus, no time must be lost in excising or cleansing completely the infected area in order to remove as promptly and thoroughly as possible the source of the toxin. The treatment with antitoxic serum, which is not a general success, seems to be based on the principle of introducing rapidly as much serum as can be done with safety by intraspinal as well as by intravenous or intramuscular injection. Details of serum may be found in the articles by F. W. Weed (The Medical Department of the United States Army in the World War **2**:289, 1927) and by W. J. Stone (A Text-Book of Medicine by American Authors, edited by Russell L. Cecil, 1933, p. 123). Weed recommends that at least 5,000 units of tetanus antitoxin be given intrathecally as soon as possible. The injection should be repeated in twelve hours if the first injection does not contain 5,000 units. At the same time from 8,000 to 16,000 units is to be given intramuscularly. Both these injec-

tions may be repeated daily for two or three days. Stone recommends the intravenous injection of 30,000 units thirty minutes after a desensitizing subcutaneous injection of 1 cc. If symptoms of anaphylaxis develop, the intravenous injection should be suspended for three hours, after which the patient "will probably be desensitized . . . and can usually receive the full dose. Injection of 30,000 units intraspinally follows the intravenous injection." These injections are repeated on the second and third days and possibly also on the fourth. It is advised to inject 10,000 units intramuscularly on the eighth day "to prevent a recurrence of symptoms from dormant bacilli or spores." For patients who react to a desensitizing dose of serum it has been recommended also that antitoxic serum be injected subcutaneously every half hour, beginning with 0.03 cc. and doubling with each injection until 25 cc. has been injected; then in four hours 40 cc. may be given and in six hours 100 cc. (C. W. McClure in Oxford Medicine **5**:202, 1928). A report on the results of the treatment of tetanus, by J. K. Calvin and A. H. Goldberg, appeared in THE JOURNAL, June 21, 1930, page 1977.

PAIN REFERRED TO RENAL AREA

To the Editor:—A woman, aged 45, a widow, had pyelocystitis in April of this year. Following the usual course of treatment the infection subsided, but there was recurrence. At this time a cystoscopic study was made, which showed trigonitis, normal kidney function, pus and bacteria from both ureters (nongonorrheal) and normal pyelo-ureterograms. Following an irrigation of the renal pelves and continuation of antiseptic treatment, the infection completely disappeared. In the last three months the patient has been having severe colicky pain, rotating between the bladder and the kidneys or involving them at the same time. There has never been any further pus in the urine in catheterized specimens, nor have bacteria been present. Roentgenograms do not show stricture of the ureters. In spite of no strictures being demonstrable, the ureters have been dilated three times and the renal pelves lavaged. This has given no relief. A urologist, in consultation, called this condition a "renal dyskinesia" and, since the patient is at the menopause, suggested that ovarian extract be given hypodermically. This also failed to give relief. Atropine has been tried, with negative results. Only morphine has relieved the pain. The attacks of pain in the last month have become more and more frequent and pain is now practically continuous. I am unable to find this complication mentioned in medical literature and would appreciate some references as to the nature of the complication and suggestions for treatment.

M.D., Washington.

ANSWER.—In reporting the clinical data the correspondent makes no mention of whether there is any evidence of renal stasis as shown by an estimation of residual urine in the renal pelvis or by means of urography. If there is no evidence of pyelectasis or ureterectasis, and judging from the description given there is none, it would be open to question whether the patient's pain is of renal origin. Pain of renal origin is rarely of a continuous nature, even though stasis may be present.

Although much has been written concerning pain of renal origin when evidence of pathologic change cannot be found, there are comparatively few data to prove that such a condition exists. Relief of pain referred to the renal area has been reported following renal sympathectomy, but it has not been proved that the specific operation was the only factor in bringing about such relief. Among the articles that have been written on this subject may be mentioned "Resection of the Nerves of the Kidney for Nephralgia and Small Hydronephroses," by E. Papin and L. Ambard (*J. Urol.* **11**:337 [April] 1924), and "Renal Sympathectomy," by E. Hess (*Pennsylvania M. J.* **33**:741 [Aug.] 1930).

One might well infer from the clinical description that the pain in this case is of extrarenal origin and, if all other clinical lesions have been carefully excluded, one would be justified in assuming that it is of a functional nature. In the absence of pyelectasis, general treatment on a functional rather than an organic basis would seem advisable.

TUBERCULOUS PHLEBITIS

To the Editor:—I have a case proved by biopsy to be tuberculosis of the anterior tibial vein. I can find no one to advise me as to how to handle it. If you have any literature on the subject or can direct me as to where to get advice, I will be greatly appreciative of it.

R. H. COWLEY, M.D., Berea, Ky.

ANSWER.—Tuberculous phlebitis has been repeatedly described by pathologists, chiefly since the classic description of Weigert on the venous tubercle in 1882. But not many clinical reports are known on the subject, most of them being in the European literature. Benda, one of the foremost students of vascular tuberculosis, differentiates a periphlebitis, spreading in continuity from tuberculous foci in the neighborhood and invading the layers of the vein from the outside, from an endophlebitis or intimal tubercle, producing an endothelial erosion and secondary thrombosis. To these two avenues of infection Liebermeister has added a possible invasion through the vasa vasorum, producing focal necrosis in the media and occurring near tuberculous foci, and a mode of infection through the lymphatics producing an exudative or caseous periphlebitis, occurring in the brain and retina, producing hemorrhages, infarcts and metastases to other veins.

In the given case, one would wish to know whether or not some other tuberculous infection of skin, tendon sheath or bone might not have invaded the vein secondarily. Assuming, however, that the correspondent is dealing with a true vascular tuberculosis, originating in the intima and producing a phlebitis obliterans, the management would depend mainly on the general status of the patient. Is there a massive pulmonary tuberculosis? Is there evidence of miliary tuberculosis? What is the patient's age? Generally speaking, if the patient is in good condition and the tuberculous phlebitis localized to one area, the most rational treatment would be a complete surgical excision. Should this be impossible because of the extent of the lesion or the existence of active tuberculous foci elsewhere in the body, roentgen irradiation of the tuberculous vein combined with a high saphenous ligation might be tried. The greatest danger in this type of lesion would be a sudden vascular dissemination of tuberculosis bacilli leading to miliary tuberculosis. Finally, if the patient is in a stage of disseminated tuberculosis in which the tuberculous phlebitis is just a partial picture, any treatment outside of complete rest and general care would seem futile. The recent literature on the pathology of tuberculous phlebitis with references to older workers can be found in Löwenstein, E.: Tuberkel-bacillämie und Gefässtuberkulose, *Zentralbl. f. Bakt.* **123**:287 (April) 1933.

DIET IN ESOPHAGEAL STENOSIS

To the Editor:—Kindly outline a diet for a boy, aged 5 years, suffering from complete stenosis of the esophagus, who has to be fed through a gastrostomy opening.

GEORGE A. CAMPBELL, M.D., Ottawa, Ont.

ANSWER.—A diet for a 5 year old boy with a complete stenosis of the esophagus, who must be fed through a gastrostomy opening into his stomach, must be ample enough to provide for maintenance as well as for growth. The properly balanced amounts of carbohydrate, protein, fat, minerals, vitamins and water should be contained in the diet of this child, in the same quantities and proportions as for the normal 5 year old.

The dietary may include milk, eggs, vegetable soups, vegetables, cereals, fruits, meats, fish, orange juice and cod liver oil. In these cases, however, even a well balanced, sufficient diet may fail to cause normal gain in weight, and general nutrition may suffer. Chevalier Jackson (*Arch. Pediat.* **40**:324 [May] 1923) has pointed out that if in these cases the child is allowed to masticate the food and spit the fluid food mixed with saliva into a funnel attached to the gastrostomy tube, an immediate improvement in nutrition and gain in weight follows. He concluded that under normal conditions a considerable amount of saliva is conveyed to the stomach between meals as well as that which is mixed and swallowed with the food, and that the addition of the saliva to the food of those children was a desirable procedure.

FEEDING EXPERIMENTS WITH RATS

To the Editor:—I am sponsoring a feeding experiment in the high school here with white rats. I should like to have general instructions for conducting such an experiment, the diets, and so on. Can tooth defects be produced in rats as well as in puppies? If so, how? Any information will be welcome and appreciated.

D. W. MATTHAEI, M.D., Fessenden, N. D.

ANSWER.—Rats should be selected of the same age, sex, and weight to be given the different types of diet. They should be about 28 days old and weigh about 40 Gm.

There should be a separate cage for each type of diet. The cages may be made by the students, wire screening being used for the sides of the cage, a pie tin for the top, and a larger basin or pan for the bottom. Discarded cold cream jars or other small cups may be used for holding food and water. Clean newspapers may be used for covering the bottom. These papers should be changed daily, and the food and water cups kept filled.

The number and types of diets fed will depend on the age and interests of the students. In the first experiment it is best to compare but two or possibly three diets and to have these applicable to the group in question. The simplest and most effective one is to give one rat bread and water, the other bread and milk. The rats should be weighed at the beginning of the experiment and weekly thereafter, and their weight curves charted. When the difference between the two has become very marked (about two or three weeks) milk may

be added to the diet of the bread and water rat, and his progress followed. If it seems wise, milk may also be removed from the diet of the bread and milk rat.

Other types of diets typical in the community or luncheons chosen in the school lunchroom may also be used, as, for example, (1) bread, meat, potato, sugar; (2) whole wheat bread, vegetables, fruits, meat; (3) bread, butter, meat, vegetables, fruits, milk. These experiments will not show results as early or as spectacularly as the simple one described and will need to be carried out for a longer time. They are, however, well adapted to high school students. So far as possible the experiments should be planned and carried out by the students.

Tooth defects cannot be produced in rats and puppies, at least under conditions of experimentation possible in a schoolroom. The chief effects that can be observed are those of growth and general appearance, such as brightness of eyes, sleekness of fur and the like.

A complete set of directions for details of such experiments, including directions for making cages for the rats, has been prepared by Mrs. Ethel Martin of the National Dairy Council. Copies may be secured by writing the organization, 111 North Canal Street, Butler Brothers Building, Chicago.

CONSTITUENTS OF DENTAL PUS

To the Editor:—A lay friend, an incorrigible microscopist, is asking embarrassing questions. Pointing to leukocytes in a fresh dark field of dental pus, he wants to know whether the sparkling particles with a brownian shimmy to be seen in the cytoplasm are phagocyted particles of extraneous material or what. Further, he asks whether the presence of these vibrant points is fraught with significance concerning the life, health or death of the containing cell; if not, how one can tell, distinguish and diagnose a live leukocyte from a dead pus cell, by its appearance or behavior. He also asks what the swarms of highly motile spirilla are in the dental pus, the length about equal to the diameter of a leukocyte. They are occasionally seen in a dense huddle. Does this pertain to their reproductive activities? Is it likely that they are pathogenic?

DON HASTINGS DUFFIE, M.D., Central Lake, Mich.

ANSWER.—White blood cells known as granulocytes originate in the bone marrow and pass into the blood vessels by their own motility. They also pass through the vessel walls when attracted by infection or foreign bodies or certain chemical agents with a positive chemotaxis. They are living cells with lobed nuclei and hence are called polymorphonuclear cells. They possess ameboid movement and can pass through the blood capillaries into the various tissues of the body. This is especially the case in so-called pyogenic infections.

The pyogenic bacteria attract the leukocytes in sufficient numbers to cause suppuration. The white cells are also phagocytic and can engulf bacteria and other foreign particles. The mobility, ameboid movement and ingestion of bacteria and other particles are evidence of life in the leukocytes. These phenomena can be studied in vitro. The brownian movement displayed by the specific granules of the leukocytes is not characteristic of life. Many minute particles in suspension display a dancing or brownian movement. The granules stain with certain stains and are called neutrophilic, eosinophilic and basophilic. They are present in cells of bone marrow origin after they mature to the myelocyte stage or the adult granulocytes. These granules also take peroxidase stains, which distinguish them from other blood cells. Phagocyted particles may be found in leukocytes, especially bacteria, red blood cells or foreign particles.

Many spirilla are found in dental pus; also various cocci, as streptococci, staphylococci and pneumococci. The most common spirilla are Vibrio sputigenus, Spirochaeta microdentium and macrodentium, Treponema mucosum, and the spirochetes of Vincent's infection, known as Spirochaeta vincenti. In syphilitic primary or secondary mouth lesions, Spirochaeta pallida can be demonstrated with the dark field.

MALDEVELOPMENT OF EAR

To the Editor:—I delivered a primipara of a living female child, in breech presentation. The child, weighing 7½ pounds (3,400 Gm.), was apparently normal. This morning the woman taking care of the case called to my attention the right ear, the outer auricle of which is not as fully developed as the left. On closer examination there is no development as regards the canal or ostium that can be determined externally, and the auricle is slightly underdeveloped. The left ear is normal in all respects. Is there anything to be done now or later or is this primarily maldevelopment?

WILLIAM KLANN, M.D., Wellington, Ohio.

ANSWER.—The deformity is due to a lack of development of the auricle and the external auditory canal. However, this does not give any information regarding the actual hearing ability of the child so far as the inner ear is concerned. In some of these cases there is also lack of development of the middle or possibly the inner ear, in which case the hearing would be either very defective or wholly absent. In so young a child it is impossible to test the hearing properly, but when it can be done in later years it will be time enough then to decide whether a plastic operation should be done. The latter is usually performed for esthetic purposes, not as an aid to hearing. Even if there is an absence of the external auditory canal, the hearing is usually quite good if the middle and inner ear are well developed. At the present time no operative work is indicated.

COCCIDIOIDAL GRANULOMA

To the Editor:—Information is desired regarding possibilities and probabilities of industrial origin of two cases of coccidioidal granuloma that recently occurred in this vicinity. Two men employed on a construction job digging a pipe line died from a disease diagnosed as coccidioidal granuloma. Question has come up whether or not the industrial hazard, as from the inhalation of dust or the spread of the disease from one man to another, is a factor. If published, please omit my name and city.

M.D., California.

ANSWER.—Coccidioidal granuloma is an acute infectious disease due to Coccidioides immitis. Some doubt still exists as to this organism being a protozoan or a mold. It is stated widely to be closely related to Oidia and Hyphomyces. The greater number of cases have appeared in California and particularly in the San Joaquin Valley. Frequently it is termed "California disease." Infection takes place with fair frequency among raw fruit handlers. This at once suggests the possibility of an occupational origin when present in this class of workers. The organism or at least its spores has been detected in the soil by Stewart and Meyers. This in turn makes possible the association of the disease among ditch diggers with an occupational origin, particularly in the state of California. Inhalation of the spores possibly constitutes the commonest mode of entry into the body. Pulmonary lesions are the commonest encountered. Transmission from animal to animal is well known and from man to man is uncertain but is regarded as within reason, as the organisms are readily found in the discharge from lesions and, in the case of skin lesions, probably are easily transferred from person to person. The two deaths mentioned among pipe line trench diggers may practically be associated with work as the source if the organism or its spores may be detected along the ditch area. If not found, the situation becomes one of speculation and conjecture. General information may be found in the following publications:

Dickson, E. C.: Oidiomycosis in California, with Especial Reference to Coccidioidal Granuloma, *Arch. Int. Med.* **16:** 1028 (Dec.) 1915.
Gardner, S. J.: *California State J. Med.* **2:** 386, 1904.
Wolbach, S. B.: *Boston M. & S. J.* **172:** 14, 1915.
Brown, P. K., and Cummis, W. T.: A Differential Study of Coccidioidal Granuloma and Blastomycosis, *Arch. Int. Med.* **15:** 608 (April) 1915.
MacNeal, W. J., and Taylor, R. R.: *J. M. Research* **30:** 261, 1914.

INFECTION OF BOWEL WITH CHEESE MITES

To the Editor:—A woman, aged 24, has been having diarrhea with from five to eight stools a day for the past three months. The stools are watery, not offensive and show no trace of blood. Microscopic examination of the stool shows the presence in great numbers of Tyroglyphus siro (cheese mites) both in the adult and in the encysted form. Could this be causing the excessive diarrhea, and if so what is the treatment for it? I can find only the slightest reference to it in the books I have. I would appreciate anything you might suggest in the line of treatment. I would appreciate a reply as soon as possible, since the patient is becoming quite anemic.

H. B. SPAULDING, M.D., Ralston, Okla.

ANSWER.—Mite infestation in the human intestine, genital tract and skin has been reported widely but not frequently, especially among the handlers of dried fruits, copra and cereals, in whom the mites produce a dermatitis. Intestinal infestations have recently been reviewed by Hinman and Kampmeier. The cheese mite Tyroglyphus siro Linn., notorious for its abundance in the "Altenburg mite cheese," has been charged with producing intestinal disorders in those who have eaten too much of this delicacy. Banks has named a mite found in cheese in the United States Tyroglyphus americanus. The two authors referred to report two cases of diarrhea associated with an abundance of mites (Tyroglyphus longior Gervais) in the stools. In one of these cases the diarrhea was accompanied by scattered rectal ulcers negative for amebas. The mites disappeared from the feces, and formed stools were reported after six days of controlled diet in the hospital. Continuous reinfestation from eating mite-contaminated food has been suggested as the cause of the continuation of the symptoms. The articles mentioned are as follows:

Hinman, E. H., and Kampmeier, R. H.: Intestinal Acariasis Due to Tyroglyphus Longior Gervais, *Am. J. Trop Med.* **14:** 355 (July) 1934.
Kampmeier, R. H., and Hinman, E. H.: Mite Infestation in the Human Intestine, *South M. J.* **27:** 271 (March) 1934.

POLLENS IN MICHIGAN

To the Editor:—Can you offer any private information as to climatic and local atmospheric conditions of Alpena, Mich., as it would influence a person afflicted with hay fever and asthma? A relative of mine, a professional man, is now living in Chicago, where he suffers greatly from his "thorn in the flesh." He has been told that Alpena, Mich., is free from hay fever and that a change to that locality will probably prove very beneficial to him. In hopes that his condition may be improved by taking up his residence in Alpena, he is considering moving there. I shall greatly appreciate your opinion regarding the local conditions prevailing in Alpena as they may be likely to influence a hay fever and asthmatic patient.

E. O. GIERE, M.D., Minneapolis.

ANSWER.—In offering an opinion on the climatic and local atmospheric conditions of Alpena, Mich., we are limiting this answer to a consideration of the probable incidence of ragweed pollen and are disregarding such factors as temperature and humidity, which in hay fever at least are not regarded as of prime importance.

A report that any locality in northern Michigan is "free from hay fever" is a rather broad statement, but the suggestion that the change would prove beneficial is probably true. No statistics on the pollen content of the air for the immediate vicinity of Alpena during the fall season are available, but it is known that ragweed pollen is almost as prevalent at Bay City (100 miles south of Alpena) as in Chicago. More than likely, however, conditions at Alpena are more like those found at Petoskey and St. Ignace, where the concentration of pollen during the fall season is only about one seventh as much as in Chicago. It is possible that prevailing southwest winds coming from the land would bring more ragweed pollen to Alpena than to Petoskey. At the latter place, most of the pollen encountered is not produced locally but is blown to the vicinity when the wind happens to be from the southwest, south or southeast. One could expect at least eight or ten days of hay fever symptoms each season at Alpena. Localities that are entirely free from ragweed pollen should be considered before deciding on a change of residence.

MAYONNAISE RECIPE WITH LIQUID PETROLATUM—DEXTROSE IN SCLEROSING SOLUTIONS

To the Editor:—Please give a recipe for making mayonnaise with petrolatum (or other dressing) as used in some reduction diets. Dextrose in 5 per cent solution is used as a sclerosing agent in the treatment of varicose veins. When the same solution and strength are used intravenously in the arm to combat shock or prior to operation, why does it not subsequently sclerose and close this vein? Please omit name.

M.D., Washington.

ANSWER.—Mayonnaise suitable for a reduction diet may be made after this formula:

1 egg
2 cupfuls of liquid petrolatum
1 teaspoonful of salt
1 teaspoonful of mustard
Paprika to taste
Made into an emulsion.

It is 50 per cent rather than 5 per cent of dextrose solution that is employed for producing sclerosis of varicose veins. Even 50 per cent solution may be injected intravenously without producing sclerosis, by delivering it drop by drop (which minimizes the effect on the intima) and by introducing it into a vein the circulation of which is active, so that the blood current dilutes it at once. There is little current in a varicose vein and the sclerosing injection is given in such a way as to secure maximum local action on the intima.

HEAD INJURIES WITH SLOUGH OF BRAIN TISSUE

To the Editor:—Mrs. W., aged 45, was brought into the hospital after being struck by an automobile. She was unconscious and there was bleeding from the right ear and right side of the nose, associated with spinal fluid; also she passed a large piece of brain tissue, with other small particles of tissue, from the right ear. She was unconscious for ten days and since then has gradually improved each day, both physically and mentally. Roentgen examination reveals a linear fracture about 4 inches in length involving the posterior portion of the right parietal bone extending into the region of the middle fossa of the skull and the base of the skull. Please advise me as to the prognosis of the future and whether or not there are many cases on record in which patients have lived after a fractured skull with the passage of brain tissue.

WILLIAM S. WEISMAN, M.D., Forest Hills, Mass.

ANSWER.—It is not rare for patients who have sustained a severe skull fracture to slough out small pieces of contused brain, although this is of course by no means common. It is difficult to answer the question as to prognosis without knowing more as to the patient's exact condition at present and as to the length of time that has elapsed since the injury. One sees comparatively minor head injuries that produce rather major mental and neurotic changes and one also sees cases in which extensive mechanical damage has failed to produce any permanent mental disability worthy of note.

POSSIBILITY OF NEGRO CHILD FROM WHITE PARENTS

To the Editor:—Several of my acquaintances know of many supposedly authentic instances in which two white parents have begotten Negro children and have discovered later that there was some small percentage of Negro blood in one of the parents. It is my contention that such occurrences are very improbable or impossible, as the inheritance of human skin pigmentation does not follow Mendel's law so simply as is the case with the hair pigmentation of rabbits and other animals but that human skin pigmentation is always very nearly a blend of that of the parents. I would appreciate an expression of your opinion regarding this matter. Please omit name.

M.D., Minnesota.

ANSWER.—Studies by the Davenports on the genetics of skin color in Negro-white crosses indicate that two nearly white hybrid parents can have offspring somewhat darker than themselves, but it is not genetically possible for nonhybrid white parents to have "Negro children" unless a melanic mutation should occur. Such mutations are extremely rare, if they occur at all. The appearance of a Negro child from white "parents" has a simpler explanation, which will occur to any one.

OLIVE OIL AND ELIMINATION

To the Editor:—I understand that some able physicians recommend a teaspoonful of olive oil before meals four times daily for successful correction of faulty elimination, with a trace of salt to render it more palatable, if preferred. It is said that if the patient is underweight he is restored to normal and, if overweight, is reduced to normal, height and age considered. There appears a widespread prejudice against olive oil, under the impression that it invariably increases weight. Your opinion or that of others would be much appreciated.

J. W. RIECKE, M.D., St. Louis.

ANSWER.—A teaspoonful of olive oil four times daily before meals would hardly serve as a cure for constipation because, according to most authorities, about 97 per cent would be digested and used in the upper part of the bowel. Accordingly, but little would be left either to increase the volume of the feces or to lubricate the colon. Four teaspoonfuls of olive oil could hardly affect a person's weight much because if all of the fat was digested it would give the body about 200 calories. The addition of 200 calories to the diet could hardly put much weight on a thin person.

PUERPERAL SEPSIS AND APPENDICITIS

To the Editor:—In your treatment of puerperal sepsis and appendicitis with abscess formation (THE JOURNAL, January 12, p. 136.) you state three methods of drainage: posterior vaginal section, extraperitoneal with incision just above Poupart's ligament, and, if either of these are impossible, you advise laparotomy. All would agree with this treatment, especially in appendicitis, but in puerperal sepsis I think it would be wise to advise to wait for the abscess to point in the culdesac or broad ligament. Also, should you not have added to your treatment the use of the Elliott machine to aid in the localization of the abscess? Would there be any effect from "large amounts of alcohol" other than its food value and its use as an appetizer? Quinine may merit some of its past reputation. Its action is probably the same as that of ergot and of solution of pituitary, which you recommend.

A. MORGAN DEARMAN, M.D., Parkersburg, W. Va.

RIDING HEAD FORWARD ON TRAINS

To the Editor:—In regard to the query of D. A. Laird, Ph.D. (THE JOURNAL, March 9) as to the reason for the head forward position in train berths, one reason not mentioned in your reply has seemed to me to be that, with the usual ventilation, smoke, cinders, dust and drafts are more of an annoyance with the head to the rear of the berth of a moving train. However, it has always seemed to me that the probability of skull and neck injuries from sudden impact in head on collisions must constitute a real danger with the head forward position as now used. It would be really interesting to know to what extent head and neck injuries do occur under such conditions with the head forward. Please omit name.

M.D., California.

HISTAMINE IN URTICARIA

To the Editor:—In Queries and Minor Notes in THE JOURNAL, January 26, page 340, C. G. Gray asks about the use of histamine in the treatment of urticaria. Your reply states that search of the literature fails "to reveal any article dealing with the use of histamine injection in the treatment of seasonal urticaria or any other form of urticaria." Permit me to call your attention to the "Use of Histamine in the Treatment of Pruritus," by Ernstene and Banka, THE JOURNAL, Feb. 4, 1933, page 328.

E. H. BOYER, M.D., Clinton, Iowa.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Final oral and clinical examination (Group A and Group B candidates).* Atlantic City, N. J., June 10-11. *Application lists close May 1.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 8, and New York, June 10. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Atlantic City, N. J., June 10, and St. Louis, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Philadelphia, June 7-8. Sec., Dr. Walter Freeman, 1726 Eye St. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: San Francisco, May 10-12, and Atlantic City, N. J., June 8-10. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

ARKANSAS: *Basic Science.* Little Rock, May 6. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Regular.* Little Rock, May 14. Sec., Dr. A. S. Buchanan, Prescott. *Eclectic.* Little Rock, May 14. Sec., Dr. L. L. Marshall, 820 W. 14th St., Little Rock.

CALIFORNIA: *Reciprocity.* San Francisco, May 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

MINNESOTA: Minneapolis, April 16-18. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in all centers where there are Class A medical schools and five or more candidates desiring to take the examination, June 24-26 and Sept. 16-18. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: *Basic Science.* Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, May 6. Sec., Dr. Edward E. Hamer, Carson City.

OREGON: *Basic Science.* Portland, May 18. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

New Jersey October Examination

Dr. James J. McGuire, secretary, State Board of Medical Examiners of New Jersey, reports the written examination held in Trenton, Oct. 16-17, 1934. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. Forty-seven candidates were examined, 44 of whom passed and 3 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Yale University School of Medicine		(1932)	90.7
George Washington University School of Medicine		(1933)	80.8
Georgetown University School of Medicine		(1933)	76.6, 78.2, 78.4, 78.6, 80.3
Howard University College of Medicine		(1933)	75.5, 79.8, 88.3
Loyola University School of Medicine		(1933)	77.1, (1934) 83.2, 83.6, 89
University of Maryland School of Medicine and College of Physicians and Surgeons		(1933)	83
Harvard University Medical School		(1933)	86.2
University of Minnesota Medical School		(1934)	78.2
St. Louis University School of Medicine		(1933)	79.2, 80
Columbia University College of Physicians and Surgeons		(1933)	89.3
Long Island College of Medicine		(1932)	86.6, (1933) 89.4
New York University, University and Bellevue Hospital Medical College		(1930)	86.5, (1933) 82.8, 85.3, 91
Hahnemann Med. College and Hospital of Philadelphia		(1932)	81.4, (1933) 83.7
Jefferson Medical College of Philadelphia		(1933)	78.7
Temple University School of Medicine		(1933)	82.6, 82.7, 83.4
University of Pennsylvania School of Medicine		(1932)	82.1
Karl-Franzens-Universität Medizinische Fakultät, Graz, Austria		(1927)	75
Medizinische Fakultät der Universität Wien		(1918)	85.7*
Universität Heidelberg Medizinische Fakultät		(1923)	82.2
Regia Università degli Studi di Firenze Facoltà di Medicina e Chirurgia		(1928)	82.5
Regia Università degli Studi di Genova Facoltà di Medicina e Chirurgia		(1924)	80.8
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1930) 75,	(1933) 75
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1929) 76,	(1933) 79.1
Regia Università di Torino Facoltà di Medicina e Chirurgia		(1933)	85*
University of St. Andrews, Scotland		(1933)	85.1

School	FAILED	Year Grad.	Per Cent
McGill University Faculty of Medicine		(1915)	59
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest		(1929)	65.2*
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1925)	56.4

* Verification of graduation in process.

New Jersey Endorsement Report

Dr. James J. McGuire, secretary, State Board of Medical Examiners of New Jersey, reports 157 physicians licensed by endorsement during 1934. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Yale University School of Medicine		(1932)	New York
George Washington University School of Medicine		(1932)	New York
Georgetown University School of Medicine		(1912), (1922), (1931)	New York, (1930) D. C., (1933) Maryland
Howard University College of Medicine		(1930)	New York
Emory University School of Medicine		(1927)	Georgia
University of Georgia Medical Department		(1917)	Penna.
Chicago College of Medicine and Surgery		(1911), (1913)	Illinois, Michigan,
Chicago Medical School		(1926)	Illinois
Rush Medical College		(1934)	N. B. M. Ex.
School of Medicine of the Division of the Biological Sciences		(1931)	New York
University of Illinois College of Medicine		(1928)	Illinois
Indiana University School of Medicine		(1918), (1929)	Indiana
State University of Iowa College of Medicine		(1926), (1932, 4), (1933)	New York, Iowa
University of Louisville Medical Department		(1919)	New York
University of Louisville School of Medicine		(1931)	N. B. M. Ex.
Johns Hopkins University School of Medicine		(1915), (1927)	New York, N. B. M. Ex.
Southern Homeopathic Medical College, Maryland		(1897)	New York
University of Maryland School of Medicine and College of Physicians and Surgeons		(1932), (1930), (1932, 4), (1933, 2)	New York, Maryland
Boston University School of Medicine		(1928), (1932)	N. B. M. Ex., (1932) New York
Harvard University Medical School		(1931, 3), (1932)	N. B. M. Ex.
University of Michigan Medical School		(1932), (1933)	Michigan
University of Minnesota Medical School		(1931)	Minnesota
Kansas City College of Medicine and Surgery, Missouri		(1918)	Arkansas
St. Louis College of Physicians and Surgeons, Missouri		(1926)	Colorado
St. Louis University School of Medicine		(1912), (1933, 2)	Missouri
Washington University School of Medicine		(1932, 2)	Missouri, (1933) N. B. M. Ex.
Columbia University College of Physicians and Surgeons		(1919), (1930), (1931, 2), (1932)	New York, (1926), (1930), (1932, 2). (1933) N. B. M. Ex.
Cornell University Medical College		(1925), (1930)	N. B. M. Ex., (1920), (1928), (1931, 3), (1932) New York
Fordham University School of Medicine		(1916)	New York
Long Island College of Medicine		(1932)	New York
New York Homeopathic Medical College and Flower Hospital		(1929), (1930), (1932),	(1933, 2) New York
New York University, University and Bellevue Hospital Medical College		(1932)	N. B. M. Ex., (1919), (1929, 2) (1930, 2) (1932, 3), (1933, 3) New York
Syracuse University College of Medicine		(1922), (1930),	(1933) New York
University of Buffalo School of Medicine		(1933)	New York
Leonard Medical School, N. Car.		(1913)	W. Virginia
Eclectic Medical College, Ohio		(1929)	Ohio
Ohio State University College of Medicine		(1931, 2)	Ohio
University of Cincinnati College of Medicine		(1925)	N. Carolina
Western Reserve University School of Medicine		(1933)	Ohio
University of Oklahoma School of Medicine		(1928), (1929),	(1933) Oklahoma, Ohio,
University of Oregon Medical School		(1925)	California
Hahnemann Medical College and Hospital of Philadelphia		(1913), (1927),	(1927), (1933) Delaware, (1932) New York, (1933) Maryland, Penna.,
Jefferson Medical College of Philadelphia		(1916), (1928),	New York, (1930, 2) Pennsylvania, (1931) North Carolina, (1933) Ohio
Medico-Chirurgical College of Philadelphia		(1909)	Penna.
Temple University School of Medicine		(1919), (1925),	(1932, 2) Pennsylvania
University of Pennsylvania School of Medicine		(1929), (1930)	N. B. M. Ex., (1927), (1932) Pennsylvania
Medical College of the State of South Carolina		(1931), (1933)	S. Carolina
University of Tennessee College of Medicine		(1930)	Tennessee
University of Vermont College of Medicine		(1921), (1931),	(1932), (1933, 6) Vermont, New York,
Medical College of Virginia		(1933), (1929),	(1931), (1932), (1933) Virginia, Alabama,
University of Virginia Department of Medicine		(1929)	N. B. M. Ex., Virginia
Queen's University Faculty of Medicine		(1918)	New York
University of Western Ontario Medical School		(1925), (1927)	Oregon, Michigan
McGill University Faculty of Medicine		(1909)	New York
University of Adelaide Faculty of Medicine		(1923)	New York
Medizinische Fakultät der Universität Wien		(1929)*	W. Virginia
Magyar Királyi Ferencz József Tudományegyetem Orvostudományi Kara, Szeged, Hungary		(1911)*	Illinois
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1931)	New York
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1931)	New York
University of Edinburgh Faculty of Medicine		(1931)	New York
University of St. Andrews, Scotland		(1933)	New York

* Verification of graduation in process.

Book Notices

Physiology in Modern Medicine. By J. J. R. Macleod, M.B., LL.D., D.Sc., Regius Professor of Physiology in the University of Aberdeen, Scotland. Assisted in the present edition by Philip Bard, Professor of Physiology, Johns Hopkins University School of Medicine, Edward P. Carter, Adjunct Professor of Medicine, Johns Hopkins University, J. M. D. Olmsted, Professor of Physiology, University of California, J. M. Peterson, Lecturer in Experimental Physiology, University of Aberdeen, and N. B. Taylor, Professor of Physiology, University of Toronto. Seventh edition. Cloth. Price, $8.50. Pp. 1154, with 297 illustrations. St. Louis: C. V. Mosby Company, 1935.

In the preface to the latest edition of this standard work, it was pointed out by Professor Macleod that the word "biochemistry" was removed from the title because the subject to which it applies has expanded greatly and has now become a science associated with physiology rather than a part of physiology. Also in the new edition the bibliography has been placed at the end of the volume instead of at the end of each section. The bibliography has also been brought down to the present and made more complete. In the new revision the section on the neuromuscular and central nervous systems has been completely rewritten by a new author, as has also the section on circulation. This book has made itself an excellent place in the literature of medicine. If there are any specific criticisms to be made they concern the inadequacy of the index, which is far too limited for a work of this scope, and also the fact that repeated printings have resulted in enough wear and tear to the type to demand a complete resetting before another edition is undertaken. The alternate light and dark lines resulting from the insertion of the new material give the book an exceedingly spotty appearance.

Biologische Untersuchungen über Farbstoffe. Band I. Von Dr. Iwao Matsuo, Professor der Medizin in Kyoto. Cloth. Pp. 494, with illustrations. Kyoto, 1934.

This is a collection of papers by Dr. Matsuo and his students. It is to be completed by the publication of a second volume, the table of contents of which is given. The series will make much of this valuable material available to the occidental reader for the first time, as many of the articles were originally published in Japanese. After a section of summarization, detailed studies are included on the physical chemistry, pharmacology and excretion of dyes. Under physical chemistry are included studies by electrophoresis of 113 acid and eighty-one basic dyes. There are also studies of the diffusibility and lipoid solubility of dyes and of their behavior in the presence of different serums, of erythrocytes and in organ extracts, with interesting but restrained conclusions about the influence of these factors. By far the largest part of the volume is devoted to dye excretion by the liver and kidneys. This is studied experimentally with a number of dyes under normal conditions and with many modifications, including india ink injections, bile duct ligature, splenectomy, liver damage with drugs, parasites, bacterial toxins or poison gases, or renal damage with poisons or after the extirpation of one or both kidneys. The use of azorubin S is recommended for liver function tests, but no mention is made of bromsulphalein. One of the most interesting papers is Takahashi's experimental study of a long series of drugs in biliary infections. In general he found that the basic dyes exerted more bactericidal action than the acid dyes, with the exception of mercurochrome, which showed striking bactericidal action, which was reduced by long contact with bile. Of the large number of dyes so studied, which did not include flumerin, only nine remained bactericidal after excretion through the liver. Studies in patients demonstrated the bactericidal action of acriflavine hydrochloride and of mercurochrome on typhoid bacilli, which was confirmed for mercurochrome in three of the experiments with rabbits given cholecystitis with typhoid bacilli. Flavicid exerted the strongest bactericidal action against B. coli and staphylococci as compared with acriflavine hydrochloride and mercurochrome. One is impressed by the enormous amount of carefully organized work represented by these papers, which should be available for reference for all workers in this field. It should be noted that the experiments seem to have been done with commercial dyes, impurities in which might be sources of error. Nevertheless, the book presents a mass of material that should be of value for future work. It is in no sense a general review and therefore lacks certain comprehensive discussions that might be of value, and it is bibliographically incomplete. It is to be hoped that a good index will be included in the second volume, as this is indispensable for complete usefulness.

The Struggle for Existence. By G. F. Gause, Zoological Institute of the University of Moscow. Cloth. Price, $3. Pp. 163, with 41 illustrations. Baltimore: Williams & Wilkins Company, 1934.

This attempt at a mathematical analysis of the processes of natural selection comes from the Laboratory of Ecology of the University of Moscow, but its genesis is traceable to the teachings and investigations of Dr. Raymond Pearl on the laws of population. In his foreword Dr. Pearl deplores the pitiful meagerness of all the attempts to portray the mechanics of natural selection by experimental and statistical methods since Darwin published his Origin of Species in 1859.

Population problems are basically biologic. They deal with the struggle for existence and natural selection, which are aspects of the dynamics of population dealing with birth rates, death rates, and interrelations of organisms in mixed populations. Since they are dynamic, they lend themselves to measurement and thus to mathematical analysis.

The author recognizes the difficulties in his path, the complexity of biologic problems, the determination of the types of mathematical procedures to fit the problems in hand, and the interpretation of the significance of the results. Nevertheless, he makes a beginning with a homogeneous population of the simplest types of organisms in an isolated and controlled environment. His results lead to the conclusion that the Verhulst-Pearl logistic curve expresses quantitatively the struggle for existence that takes place between individuals within a homogeneous group.

From this simplified basis he next proceeds to analyze the competition between two different kinds of yeast cells mingled in one culture medium and finds that his results coincide with Volterra's equation and express competition between species in terms of the growing population themselves. He interjects the caution that "Only in those cases, where the results deduced from equations are confirmed by the data obtained through entirely different methods, by a direct study of the factors limiting growth, can we be sure of the correctness of the quantitative theories." If the properties of two species growing separately, i. e., their coefficients of geometric increase, their maximal volumes, and alcohol production per unit of volume when alcohol limits the growth, are determined and these values are connected into a theoretical equation of the struggle for existence, one can calculate in what proportion a certain limited amount of energy will be distributed between the populations of two competing species. This means that one can calculate theoretically the growth of species and their maximal volumes in a mixed population. The equation of the struggle for existence expresses the idea that a potential geometric increase of each species in every infinitesimal interval of time is realized only up to a certain degree, depending on the unutilized opportunity for growth at that moment, and that the species possesses certain coefficients of seizing this unutilized opportunity. These results hold only under aerobic conditions, owing to the fact that under anaerobic conditions waste products complicate the situation.

The competition between two species of ciliate Protozoa for a common food supply lends itself to mathematical analysis. In the first period the two species compete for the still unutilized sources of energy. The proportion in which this energy is distributed between the two species is determined by the system of Volterra's differential equations of competition, but the coefficients of the struggle for existence in these equations change during the growth of the population and become more complicated. In the second period there is a redistribution of the completely seized energy between the two species, which is again controlled by the differential equations of competition. The species with the greater value of the coefficient of multiplication eventually drives out the one with a lesser value.

A study of a protozoan population consisting of a predator and its prey did not exhibit the classic oscillations in numbers assumed by Lotka and Volterra but was to be explained by

special biologic adaptations. In another combination lacking such adaptation, the expected oscillations occurred.

It is to be noted that in all these elementary studies of population the organisms are isolated under control and are presumably exempt from disease (except such as may possibly be due to genetic defects). In nature one of the great factors in the destruction of the individual is disease. This too has a selective action and resistance to it a survival value. How far the higher mathematics of the study of populations will aid in the analysis of these still greater complications resulting from the introduction of the pathogene into the struggle for existence, only the future can reveal.

L'angiographie cérébrale: Ses applications et résultats en anatomie, physiologie et clinique. Par Egas Moniz, professeur de neurologie à la Faculté de médecine de Lisbonne. Paper. Price, 90 francs. Pp. 327, with 192 illustrations. Paris: Masson & Cie, 1934.

This work on cerebral angiography represents the author's experience with the method over a period of three years. The present volume is the result of the author's attempt to visualize the cerebral arteries radiographically, but the perfection of his technic and his many unique applications of the method have enabled him to produce a beautiful series of roentgenograms illustrating the localization and diagnosis of brain tumors, cerebral varices, aneurysms of the cerebral arteries, and angiomas. He has also been able to demonstrate many interesting anatomic features of the cerebral circulation, such as the passage of the opaque solution through the arterial circulation, the capillaries and the veins. He further demonstrates the meningeal circulation. By a series of films made at short intervals after the injection of the opaque solution, many unusual roentgenograms are produced to illustrate the cerebral circulation. Formerly the author used a 25 per cent solution of sodium iodide for the injection, preceded by the administration of phenobarbital and morphine. With this technic untoward results were encountered in cases of arteriosclerosis, toxemias and uremias. With the introduction of thorium dioxide sol as an opaque medium the author carried out a series of experiments to determine the effect of this solution when injected into the skin, under the skin and intramuscularly. No undesirable reactions were encountered. Since limiting himself to the use of this medium for angiography, the author has found no undesirable reactions even in the types of cases in which the sodium iodide produced undesirable reactions. The technic consists essentially in cutting down on the common carotid artery and with a small caliber needle injecting from 0.5 to 1 cc. of solution. If there is no reaction, he completes the injection of from 8 to 13 cc. of the thorium dioxide sol. Films are made at intervals of one second during the injection, a rapid exposure of about one-tenth second being used. The illustrations are unusually clear and interesting and they definitely demonstrate such unusual entities as cerebral varices, angiomas, vascular and avascular tumors, and hydrocephalus. This volume represents an excellent atlas on the subject. While of special interest to the neurologist, neurosurgeon and radiologist, the book will be of unusual interest to any one interested in a really epochal advance in the diagnosis of intracranial lesions.

Modern Operative Surgery. Edited by G. Grey Turner, M.S., F.R.C.S., F.A.C.S., Senior Hon. Surgeon, Royal Infirmary, Newcastle-upon-Tyne. In two volumes. Second edition. Fabrikoid. Price, $16 per set. Pp. 868; 896, with 871 illustrations. Baltimore: William Wood & Company, 1934.

This is a symposium by twenty-seven British surgeons. The first edition was issued in 1925 by H. W. Carson and is now revised by G. G. Turner. It is the result of an attempt to present to the profession an authoritative survey of the whole range of modern surgical operations, including those on the eye, ear, nose, throat and nervous system. The closely written text furnishes details of preoperative preparations and points out difficulties and dangers arising during or after surgical procedures. Overlapping, nearly unavoidable in a cooperative work, has been reduced to a minimum, but one is surprised to note an unevenness and lack of balance in the consideration allotted to various subjects. The surgery of the spinal cord and the sympathetic system, for example, is described in great detail. On the other hand, such an important subject as thyroidectomy has been treated in a stepmotherly fashion; the discussion of indications for blood transfusions is meager, and new apparatus is not described. Of the many solutions used for injection of varicose veins, only sodium salicylate and quinine and urea are cited. In the chapter on intestinal obstruction the diagnostic value of roentgenograms and the therapeutic value of transduodenal decompression with the nasal catheter have not been pointed out. The subject of hernias is inadequately covered; one looks in vain for a description of Ferguson's or Girard's operation. The value of the resectoscope in prostatic surgery is not discussed. Placing of bibliographic references in the text and not at the foot of the page is disturbing; furthermore, references are made almost exclusively to publications twenty or more years old. The quality of illustrations is mediocre and their style old fashioned. Several chapters, particularly those written or revised by Turner, are excellent; sections on abdominal surgery and neurosurgery are well presented. The aim and scope of this work are so large that space probably did not allow a more detailed description of the technic; therefore the book will have its greatest appeal to a young surgeon, for whom in spite of its minor flaws it will furnish an immense wealth of information in lucid sequence.

L'année électro-radiologique. Par Morel-Kahn, avec la collaboration de MM. G. Bonte, A. Devois, G. Duclaux, T. Fainsilber, H. Fischgold, J. Guilhem, R. Humbert, P. Marques, W. Strouzer et L. Stuhl. Première année. Paper. Price, 40 francs. Pp. 232, with 28 illustrations. Paris: Masson & Cie, 1934.

This is the first of a series of year books on electroradiology written by the author and a number of collaborators. The more recent contributions to the field of diagnostic roentgenology are discussed in the first chapter. Of special interest are the recent advances in soft tissue radiography, intravenous urography, the Proetz displacement method for the visualization of the nasal sinuses, and mucosal relief examination of the gastro-intestinal tract. The section on radiotherapy presents some interesting contributions on the use of roentgenotherapy in acute inflammatory processes. The Coutard method for the radiologic management of cancer is discussed. A chapter dealing with the complications arising from the use of radium in the management of carcinoma of the uterus is interesting and important. Finally there is a summary of the question of 500,000 volt therapy. The third section of the book deals with the more recent contributions in the field of physical therapy, and the final chapter presents a rather novel idea in giving an outline of the more important international radiologic meetings of the year. The book will be of interest especially to the radiologist.

The Treatment of Common Female Ailments. By Frederick John McCann, M.D., F.R.C.S., F.C.O.G., Consulting Surgeon Samaritan Free Hospital for Women, London. Third edition. Cloth. Price, $4.75. Pp. 379. Baltimore: William Wood & Company, 1934.

The demand for this work by the general practitioner provided the opportunity for complete revision and additional new material. This edition contains a great deal of useful information ably presented, augmented by illustrative case reports from the author's personal experience. The subject of medical gynecology is fairly well covered and each subject is treated from the standpoint of practical management.

The book is well organized, is printed on good paper with readable type, and is fairly free from errors. The statement "the clotting of menstrual blood is said to be due to a tryptic ferment contained in the premenstrual secretion of the uterine glands" (p. 72) is one exception. The author probably means that the nonclotting is due to the action of a tryptic ferment, in accordance with the view of Oskar Frankl. Another error is found on page 115 in the discussion of vaginitis, Trichomas vaginalis being mentioned in place of Trichomonas vaginalis. It is regrettable that he did not dwell at greater length on this form of vaginitis, which is encountered so commonly and which has proved so refractory to treatment.

His advice in the use of the operation of curettage in menorrhagia is sound, but his opinion regarding the rôle of alcohol and the use of contraceptives in the causation of menorrhagia may be challenged.

Wholesome advice is given to the physician concerning "the upbringing and education of girls" in the chapter on the prevention of female ailments.

The book will be found useful to physicians in general practice. It is not illustrated.

Physiologie et physiopathologie du système réticulo-endothélial. Par Albert H. Du Bois, chef de clinique à la clinique médicale universitaire de Genève. Préface du Professeur M. Roch. Paper. Price, 36 francs. Pp. 204. Paris: Masson & Cie, 1934.

In this monograph the author reviews many of the contributions to the subject of the reticulo-endothelial system, particularly those made between the years 1925 and 1930. The bibliography of 588 papers will be of value to all workers in the field. The book consists of eighteen chapters in which such phases as the morphology of the mesenchymal tissues, achievements of vital staining and the physiologic and pathologic activities of reticulo-endothelial tissues are considered. The presentation is more descriptive than analytic but represents an enormous amount of labor in assembling the more recent evidence concerning the important functions of the active mesenchyme. Particular emphasis is placed on the relationship to immunity, allergy, abnormalities of lipoid metabolism and chemotherapy. The style is simple and direct and the index has been carefully compiled. The monograph is an excellent summary of progress during a five year period of significant activity in the development of the reticulo-endothelial concept.

The Clinical Aspects of Visceral Neurology, with Special Reference to the Surgery of the Sympathetic Nervous System. By W. K. Livingston, M.D., Clinical Associate in Surgery, University of Oregon Medical School. Cloth. Price, $5. Pp. 254, with 46 illustrations. Springfield, Ill., & Baltimore: Charles C. Thomas, 1935.

This monograph is based on the author's personal observation of 300 cases requiring visceral nerve surgery, studied closely before and after operation. Livingston divides his subject matter into three parts: the structure and functions of the visceral nervous system, clinical conditions treated by visceral nerve surgery, and surgical procedures. The first part contains the structure and functions of the visceral nervous system, which is further divided into four chapters, in which the anatomy of the visceral nervous system, physiology and pharmacology, visceral pain and the normal regulation of blood vessel function are discussed in simple and easily understandable language. The second part is divided into five chapters in which the clinical conditions treated by visceral nerve surgery are discussed. The author describes cases of Raynaud's disease, erythromelalgia, scleroderma, hypertension and occlusive diseases of the blood vessels in which operation was performed and gives the results obtained. The postoperative results of cases of chronic arthritis, angina pectoris and pelvic disorders are also given. The last part consists of a discussion of the prognostic methods used in determining the status of the involved areas, and the mechanism and technic of the various surgical procedures used on the sympathetic and the somatic nervous system. There is an excellent bibliography for the student interested in visceral neurology and the surgery of the sympathetic nervous system. Many of the author's views on the physiology of the visceral nervous system are controversial, but he pleads for more work in this regard in the hope that these controversial points may be settled accurately.

A Manual of Biochemistry. By J. F. McClendon, Professor of Physiological Chemistry, University of Minnesota Medical School. Cloth. Price, $5. Pp. 381, with 56 illustrations. New York: John Wiley & Sons, Inc., London: Chapman & Hall, Ltd., 1934.

The title and size of this book would lead one to expect an elementary, brief and practical textbook of biochemistry. The work is exceedingly elementary and brief in some respects but it becomes rather involved and specialized in others. The book is unique in many respects. This uniqueness resides in the author's curious style, in the lack of orderly presentation, in many exceedingly misleading statements, in the peculiar order of presentation, in the questionable choice of material, and in the addition of rather inappropriate and often poorly reproduced illustrations. The text is divided into six parts. Part I is a disconnected introduction covering a great variety of factors. Part II, entitled "Inorganic," includes most of the inorganic elements, radiation in therapeutics, and permutit in water softening. Part III, entitled "Organic," develops too briefly the chemistry of carbohydrates, lipins and proteins. One wonders why benzoic acid is included under proteins and why citrullin is never referred to, even in discussing urea formation in a later chapter. Part IV, entitled "Nitrogenous Bases," curiously includes hematin, bilirubin and chlorophyll. The composition of foods, digestion, metabolism and excretion are treated with entirely too much brevity; only two and one-half pages on metabolism. One wonders again why one paragraph is devoted to the entire endocrine system in the section on excretion. Part V is devoted to an unorganized collection of laboratory experiments often again of peculiar choice for a textbook of this scope and grade. Part VI is an alphabetically arranged list of some thousand substances from sodium to water with their more common physical and physiologic properties. Such important substances as glycuronic acid, theelin, theelol, citrullin, saccharase and emulsin are omitted, while such an odd substance as cimicic acid, which "occurs in bedbugs," is listed.

Dennoch Landarzt! Erfahrungen und Betrachtungen aus der Praxis. Von Dr. August Heisler. Second edition. Paper. Price, 4.80 marks. Pp. 229. Munich: Verlag der aerztlichen Rundschau Otto Gmelin, 1933.

This book is written by a country doctor in the Black Forest of Baden. Living in Koenigsfeld, he practices throughout a large highland district embracing ten hamlets and a considerable peasant population. He is also chief of a sanatorium and a children's home, and physician in charge of a large private school. Well trained by six years of assistantship in the universities and clinics of Freiburg, Munich, Bonn, Marburg and Heidelberg, he has also profited by a large professional experience and a talent for observation to form independent judgments of a great number of medical problems of all kinds that present themselves to general practitioners. He discusses with many interesting illustrations psychotherapy, the sex problems, homeopathy, toward which he is quite sympathetic, and the relation of country doctors to medical schools and clinics. He then gives his experiences and methods of treatment in obstetrics, dietary problems, allergic disorders, blood transfusion, hypertension, infectious diseases, tuberculosis and the psychoses. Although a few of the author's theories and therapeutic recommendations may not be in accordance with the general opinions of the majority of physicians, the book will interest both rural and city practitioners, who will equally admire the author's striking verbal pictures and his shrewd observations on modes of medical practice.

Voluntary Sterilization. By C. P. Blacker, M.C., M.A., M.D., General Secretary of the Eugenics Society. Cloth. Price, $1.75. Pp. 145. New York & London: Oxford University Press, 1934.

This volume begins with a history of sterilization in England, leading up to the sterilization bill, which has resulted from the so called Brock report. There is a brief statement as to the nature of sterilization operations and then a general discussion of laws relating to sterilization. This concludes with the statement that "the social injustice which arises from the present uncertain state of the law about sterilization is one of the strongest arguments in favor of the whole subject being cleared up by the passing of a carefully drafted sterilization law." There follows a chapter on hereditary defects and diseases and then a discussion of the fertility of the defective producing classes.

In his discussion of sterilization in other countries, Dr. Blacker indicates the highly confused situation that exists in the United States. The explanation of the situation seems to be that the enthusiasm of small groups secured the passage of legislation for which there was no general demand and no sufficient backing of public opinion. Sterilization laws will succeed only when public opinion is enlisted to support them. The objections to sterilization are marshaled in a chapter with this title, the volume concluding with an analysis of the available literature on the inheritance of mental deficiency.

Old Age—Medically Considered. A Series of Papers by Medical Authorities on the Physical and Dietetic Treatment of Diseases and Disabilities of Old Age. By Medical Authorities. With a foreword by R. King Brown, B.A., M.D., D.P.H. Reprinted from the British Journal of Physical Medicine. Paper. Price, 3/-. Pp. 96, with illustrations. London: Actinic Press, Ltd., 1934.

This volume is a collection of articles previously published in the *British Journal of Physical Medicine*. It is full of practical advice relative to the care of the aged, written by a number of competent British authorities. The essays are quite short but sufficiently long to provide innumerable excellent suggestions.

Medicolegal

Workmen's Compensation Acts: Pulmonary Asbestosis an "Injury by Accident," Not an Occupational Disease.—McNeely brought a common law action for damages against his employer, the Carolina Asbestos Company. He alleged that the atmosphere in the room in which he worked for some fifteen months was heavily impregnated with asbestos dust, that his employer negligently failed to provide a dust or suction system or any proper ventilating system, and that because of the employer's negligence he inhaled such quantities of asbestos dust during his employment that he became afflicted with pulmonary asbestosis. The trial court, holding that the workman's disability was compensable under the workmen's compensation act of North Carolina and that he should have proceeded thereunder rather than at common law, rendered judgment for the employer. McNeely then appealed to the Supreme Court of North Carolina.

The workman contended that the workmen's compensation act applies only to an "injury by accident" arising out of an employment. Since pulmonary asbestosis, he argued, develops slowly and progressively, it is an occupational disease and not an "injury by accident" and is not, therefore, covered by the compensation act. The term "occupational disease," said the Supreme Court, has been variously defined and interpreted in judicial decisions and textbooks. Schneider in his "Workmen's Compensation Law," vol. 1 (ed. 2), p. 644, states that

> A disease contracted in the usual and ordinary course of events, which from the common experience of humanity is known to be incidental to a particular employment, is an occupational disease, and not within the contemplation of the Workmen's Compensation Law.

And the Supreme Court of Iowa, in *Gay* v. *Hocking Coal Co.*, 184 Iowa 949, 169 N. W. 360, said that

> An "occupational disease" suffered by a servant or employee, if it means anything as distinguished from a disease caused or superinduced by an actionable wrong or injury, is neither more nor less than a disease which is the usual incident or result of the particular employment in which the workman is engaged, as distinguished from one which is caused or brought about by the employer's failure in his duty to furnish him a safe place to work. If the employer fails to provide a reasonably safe place to work, or fails to observe the specific requirements of the statute with respect thereto, and as a result of such neglect the employee is injured, the liability of such employer cannot be avoided by calling such injury an "occupational disease," or by showing that disease of that nature is often the accompaniment or result of such employment, even when all due care has been exercised by the employer.

Assuming the correctness of these definitions, continued the Supreme Court, and considering the facts of this case, it is obvious that McNeely's ailment was not an occupational disease. He testified that he had worked in a similar capacity in another asbestos plant for about eleven years prior to his employment with the defendant without suffering any ill effects from the work. His injury, then, was not produced by the inherent nature of his work itself, and classifiable as an occupational disease, but was produced rather by the active negligence of the employer in failing to maintain a dust or suction system such as is in general use in other asbestos plants.

The Supreme Court moreover concluded that McNeely's ailment or injury was accidental within the meaning of the compensation act. In *Conrad* v. *Cook-Lewis Foundry Co.*, 198 N. C. 723, 153 S. E. 266, said the court, this court, in construing the term "injury by accident," as used in the workmen's compensation act, said:

> The word "accident," as used here, has been defined as an unlooked for and untoward event which is not expected or designed by the person who suffers the injury.

It seems to be generally conceded that if a workman should suddenly inhale air laden with any destructive agencies producing injury immediately, or within a short period of time, such injury would be deemed to be accidental or an "injury by accident." It does not seem, continued the court, that the time element should be controlling. If so, the courts are forced into a field of speculation in an effort to determine what standard of time shall be adopted in determining the rights of the parties. It would not seem that the unexpected, unforeseen and therefore accidental inhalation of deleterious matter could be deprived of its accidental quality by the mere consideration of whether it took five days or five months to produce the injury.

For the reasons stated, the court concluded that McNeely's injury was compensable under the act and that he had no right to proceed at common law. It accordingly affirmed the judgment of the lower court in favor of the employer.—*McNeely v. Carolina Asbestos Co. (N. C.), 174 S. E. 509.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Mobile, April 16-18. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.
American Academy of Pediatrics, New York, June 7-8. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
American Association for the Study of Neoplastic Diseases, Baltimore, April 18-20. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N. W., Washington, D. C., Secretary.
American Association for Thoracic Surgery, New York, June 3-5. Dr. Duff S. Allen, 3720 Washington Boulevard, St. Louis, Secretary.
American Association of Anatomists, St. Louis, April 18-20. Dr. George W. Corner, University of Rochester School of Medicine, Rochester, N. Y., Secretary.
American Association of Pathologists and Bacteriologists, New York, April 18-19. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.
American Association of the History of Medicine, Atlantic City, May 6. Dr. Edward J. G. Beardsley, 1919 Spruce Street, Philadelphia, Secretary.
American Association on Mental Deficiency, Chicago, April 25-27. Dr. Groves B. Smith, Beverly Farms, Godfrey, Ill., Secretary.
American Bronchoscopic Society, Toronto, Canada, June 1. Dr. Lyman Richards, 319 Longwood Drive, Boston, Secretary.
American College of Physicians, Philadelphia, April 29-May 3. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.
American Dermatological Association, White Sulphur Springs, W. Va., May 2-4. Dr. William H. Guy, 500 Penn Avenue, Pittsburgh, Secretary.
American Federation of Organizations for the Hard of Hearing, Cincinnati, June 2-6. Miss Betty C. Wright, 1601 35th Street N. W., Washington, D. C., Secretary.
American Gynecological Society, Hot Springs, Va., May 27-29. Dr. Otto H. Schwarz, 630 South Kingshighway Boulevard, St. Louis, Secretary.
American Laryngological Association, Toronto, Canada, May 29-31. Dr. William V. Mullin, 2020 East 93d Street, Cleveland, Secretary.
American Laryngological, Rhinological and Otological Society, Toronto, Canada, June 3-5. Dr. Robert L. Loughran, Sharon, Conn., Secretary.
American Neurological Association, Montreal, Canada, June 3-5. Dr. Henry Alsop Riley, 117 East 72d Street, New York, Secretary.
American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. J. Milton Griscom, 2213 Walnut Street, Philadelphia, Secretary.
American Orthopedic Association, Philadelphia, June 5-8. Dr. Ralph K. Ghormley, Mayo Clinic, Rochester, Minn., Secretary.
American Otological Society, Toronto, Canada, May 27-29. Dr. Thomas J. Harris, 104 East 40th Street, New York, Secretary.
American Pediatric Society, Cleveland, May 2-4. Dr. Hugh McCulloch, 325 North Euclid Avenue, St. Louis, Secretary.
American Psychiatric Association, Washington, D. C., May 13-17. Dr. William C. Sandy, State Education Building, Harrisburg, Pa., Secretary.
American Society for Clinical Investigation, Atlantic City, May 6. Dr. H. L. Blumgart, 330 Brookline Avenue, Boston, Secretary.
American Society of Clinical Pathologists, Atlantic City, N. J., June 7-9. Dr. A. S. Giordano, 531 North Main Street, South Bend, Ind., Secretary.
American Surgical Association, Boston, June 6-8. Dr. Vernon C. David, 59 East Madison Street, Chicago, Secretary.
American Therapeutic Society, Atlantic City, N. J., June 7-8. Dr. Oscar B. Hunter, 1835 Eye Street N. W., Washington, D. C., Secretary.
Arizona State Medical Association, Phoenix, April 25-27. Dr. D. F. Harbridge, 15 East Monroe Street, Phoenix, Secretary.
Arkansas Medical Society, Fort Smith, April 15-17. Dr. W. R. Brooksher, 602 Garrison Avenue, Fort Smith, Secretary.
Association of American Physicians, Atlantic City, May 7-8. Dr. James H. Means, Massachusetts General Hospital, Boston, Secretary.
California Medical Association, Yosemite, May 13-16. Dr. F. C. Warnshuis, 450 Sutter Street, San Francisco, Secretary.
Connecticut State Medical Society, New Haven, May 22-23. Dr. C. W. Comfort Jr., 27 Elm Street, New Haven, Secretary.
District of Columbia, Medical Society of the, Washington, May 1. Dr. C. B. Conklin, 1718 M Street N.W., Washington, Secretary.
Florida Medical Association, Ocala, May 13-15. Dr. Shaler Richardson, 111 West Adams Street, Jacksonville, Secretary.
Georgia, Medical Association of, Atlanta, May 7-10. Dr. Allen H. Bunce, 139 Forrest Avenue N.E., Atlanta, Secretary.
Illinois State Medical Society, Rockford, May 21-23. Dr. Harold M. Camp, Lahl Building, Monmouth, Secretary.
Iowa State Medical Society, Davenport, May 8-10. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.
Kansas Medical Society, Salina, May 8-10. Mr. Clarence Munns, Stormont Building, Topeka, Executive Secretary.
Louisiana State Medical Society, New Orleans, April 29-May 1. Dr. P. T. Talbot, 1430 Tulane Avenue, New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 23-24. Dr. Walter Dent Wise, 1211 Cathedral Street, Baltimore, Secretary.
Massachusetts Medical Society, Boston, June 3-5. Dr. Alexander S. Begg, 8 The Fenway, Boston, Acting Secretary.
Mississippi State Medical Association, Biloxi, May 14-16. Dr. T. M. Dye, McWilliams Building, Clarksdale, Secretary.
Missouri State Medical Association, Excelsior Springs, May 6-9. Dr. E. J. Goodwin, 634 North Grand Boulevard, St. Louis, Secretary.
National Association of Private Psychiatric Hospitals, Washington, D. C., June 1. Dr. James M. O'Neill, St. Vincent's Retreat, Harrison, N. Y., Secretary.
Nebraska State Medical Association, Omaha, May 14-16. Dr. R. B. Adams, Center-McKinley Building, Lincoln, Secretary.
New Hampshire Medical Society, Manchester, May 7-8. Dr. Carleton R. Metcalf, 5 South State Street, Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, April 30-May 2. Dr. J. B. Morrison, 66 Milford Avenue, Newark, Secretary.
New York, Medical Society of the State of, Albany, May 13-15. Dr. Daniel S. Dougherty, 2 East 103d Street, New York, Secretary.
North Carolina, Medical Society of the State of, Pinehurst, May 6-8. Dr. L. B. McBrayer, Southern Pines, Secretary.
North Dakota State Medical Association, Minot, May 27-28. Dr. Albert W. Skelsey, 20½ Broadway, Fargo, Secretary.
Oklahoma State Medical Association, Oklahoma City, May 13-15. Dr. L. S. Willour, 203 Ainsworth Building, McAlester, Secretary.
Rhode Island Medical Society, Providence, June 6. Dr. J. W. Leech, 167 Angell Street, Providence, Secretary.
South Carolina Medical Association, Florence, April 23-25. Dr. E. A. Hines, Seneca, Secretary.
South Dakota State Medical Association, Pierre, May 13-15. Dr. John F. D. Cook, Langford, Secretary.
Texas, State Medical Association of, Dallas, May 13-16. Dr. Holman Taylor, 208 Medical Arts Building, Fort Worth, Secretary.
West Virginia State Medical Association, Wheeling, May 6-8. Mr. Joe W. Savage, Public Library Building, Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Review of Tuberculosis, New York

31: 121-260 (Feb.) 1935

*Roentgen-Ray Appearance of Lung Fields in Atelectatic Bronchiectasis. R. H. Overholt, Boston.—p. 121.
New Operating Thoracoscope. H. I. Goodman, New York.—p. 134.
*The Question of When Artificial Pneumothorax Should Be Discontinued. P. Dufault and A. Laroche, Rutland, Mass.—p. 139.
Hypersensitivity to Novocain in Artificial Pneumothorax Therapy. W. M. MacKay, Waltham, Mass.—p. 147.
Apical Localization of Pulmonary Tuberculosis: Pulmonary Tissues as Excretory Organs for Tubercle Bacilli. J. J. Hurwich and G. Milles, Chicago.—p. 151.
Acute Subapical Versus Insidious Apical Tuberculosis: III. Report of One Thousand Cases. B. H. Douglas, J. P. Nalbant and M. Pinner, Northville, Mich.—p. 162.
Stability of Colony Morphology and Pathogenicity of B C G. Dorothy M. Behner, New York.—p. 174.
Reinfection Among Tuberculo-Allergic Doctors and Nurses at Fitzsimons Hospital. W. C. Pollock and J. H. Forsee, Denver.—p. 203.
Blood Counts in Clinically Healed Pulmonary Tuberculosis. J. M. Kurung, Ray Brook, N. Y.—p. 217.
Influence of Pregnancy on Pulmonary Tuberculosis. G. G. Ornstein and M. Kovnat, New York.—p. 224.
Psychic Element in Etiology of Tuberculosis. M. J. Breuer, Lincoln, Neb.—p. 233.
*Giant Saccular Bulla of Lung: Report of Case, with Discussion of Its Formation. W. Haymaker and A. A. Karan, Wallum Lake, R. I. —p. 240.

Roentgen Appearance of Lung Fields in Atelectatic Bronchiectasis.—Overholt illustrates, by reporting three cases, that evidence of bronchiectasis affecting the left lower lobe may be seen in the plain roentgenogram as secondary effects produced in the upper lobes. These secondary effects are revealed in the plain roentgenogram as a difference in density of the lung fields (indicating distention of the upper lobe on the affected side) and as an inequality in the position of the diaphragm best seen in the lateral roentgenogram. When such changes are seen in the ordinary postero-anterior and lateral views, by inference an atelectatic bronchiectasis of the lower lobe should be suspected. It is not always necessary, therefore, to visualize an involved lobe behind the heart shadow. Undoubtedly there are many similar cases, in sanatoriums and elsewhere, which present cough, expectoration, occasional hemoptysis, negative sputum and roentgenograms that are inconclusive. A close study of the plain roentgenogram may reveal changes indicative of a shrunken bronchiectatic lobe behind the shadow of the heart. The investigation then can be supplemented by bronchoscopy and bronchography to confirm the diagnosis.

When Artificial Pneumothorax Should Be Discontinued.—In an endeavor to state when pneumothorax should be discontinued, Dufault and Laroche review the situation and summarize its status. 1. Abandonment of pneumothorax is advocated first of all to prevent the permanent loss of function that might result from a long standing state of collapse. This argument does not stand after a moment of reflection. The healthy areas remain practically unchanged and readily resume their function whenever allowed to unfold, regardless of the duration of their immobilization. Their elasticity has not been impaired. The diseased tissues alone are incapable of reexpansion, provided sufficient proliferative organization has taken place. 2. The inconvenience to the patient becomes pressing when he contemplates leaving the sanatorium. Where shall he have his refills? 3. Unless the refills are obtained from a state or county sanatorium or from a free clinic, they are somewhat costly, and the prospect of continuing them for several years is not a cheerful one to the patient of moderate or small means. This can always be arranged somehow. It should not be forgotten that the cost of illness and invalidism is still a greater burden to the patient or to his community than that of treatment. One or the other has to pay. 4. The danger of embolism, of pleural shock or of infection must be mentioned. The eventualities in store for the reexpanded lung are considered. Complete excision of the pathologic process, were it possible, would be the ideal solution. In the meantime, the best that can be done is to keep the diseased areas under control by artificial collapse and to make such a collapse as complete, as effective and as lasting as possible. Fibrotic bands and calcified nodules, which are the final stages of healing throughout the necrotic areas, are only walling in the bacilli and, at their best, can be nothing but scars, of no use whatever to the function of ventilation. Their untimely release is fraught with danger. This feeling is being implicitly expressed every time a phrenic exeresis or thoracoplasty is performed with the view of adding to the duration of a pneumothorax. 5. The condition of the lung before collapse is one of the deciding factors when reexpansion is considered. An objection often raised to the establishment of pneumothorax in early lesions is that it should be kept in reserve in case of future breakdowns. The authors advocate the institution of a collapse from the beginning and suggest its continuance until one feels satisfied that complete absorption has taken place. In simple exudations and recent infiltrations without visible cavities the leading authorities seem to agree that from two to three years of collapse, counting from the time the sputum turned negative, should be sufficient. This is the minimal duration of pneumothorax, with the exception of bilateral cases, when the question is altogether different. It is granted that durable results have been obtained in a shorter time, but their percentage is relatively small. In the case of an older, fibrocaseous lesion, with thick walled cavities, a minimum of from five to seven years is required. That period is not arbitrarily set. It is based on the slow process of healing in tuberculosis. It is also substantiated by surveys of reexpanded cases followed from two to ten years.

Giant Saccular Bulla of Lung.—Haymaker and Karan report a case of a giant bulla projecting beyond the limits of the lung in the form of a sac. It is part of the picture of compensatory emphysema complicating pulmonary tuberculofibroid disease. There is presumptive evidence that an interlobar fibrous pleural band was in a large measure instrumental in causing the bulla to attain such a large size. They describe the mechanical effect of such a fibrous band on an early bulla in the contralateral lung in detail to illustrate the development that presumably took place in the incipient stage of the giant bulla.

Archives of Dermatology and Syphilology, Chicago

31: 159-290 (Feb.) 1935

Rosacea-like Tuberculid of Lewandowsky. G. M. MacKee and M. B. Sulzberger, New York.—p. 159.
Rosacea-like Tuberculosis: Review of Literature with Report of Five Cases. U. J. Wile and F. H. Grauer, Ann Arbor, Mich.—p. 174.
Improved (Paraffin Section) Method for Dopa Reaction with Considerations of Dopa-Positive Cell, as Studied by This Method. S. W. Becker, L. L. Praver and H. Thatcher, Chicago.—p. 190.
*Acrodermatitis Chronica Atrophicans. S. E. Sweitzer and C. W. Laymon, Minneapolis.—p. 196.
Pellagra in India: Report of Case. G. Panja, Calcutta, India.—p. 213.
*New Immunologic Reaction for Diagnosis of Lymphogranuloma Inguinale: Preliminary Report. F. Reiss, Shanghai, China.—p. 215.
Membrane Method for Determining Fungicidal Action of Chemicals: Its Clinical Implications. H. Sharlit, New York.—p. 217.
*Use of Maize Oil (Unsaturated Fatty Acids) in Treatment of Eczema: Preliminary Report. T. Cornbleet, with collaboration of E. R. Pace, Chicago.—p. 224.

Acrodermatitis Chronica Atrophicans.—Sweitzer and Laymon call attention to some of the more unusual features of acrodermatitis chronica atrophicans and present five illustrative cases. One case showed almost universal atrophy of the skin with fibrous nodules, arthritis deformans, atrophy of bone, ulnar bands, scleroderma-like changes with ulceration and extensive atrophy of the mucous membranes of the tongue, mouth and vagina. This involvement of the mucosa was most unusual. In another case, both diffuse and macular atrophy with ballooning were present. Two cases well illustrated the scleroderma-like changes, one of them being further complicated by ulceration. The last case demonstrated the odd association of acrodermatitis chronica atrophicans with lichen planus. The authors conclude that acrodermatitis chronica atrophicans is a chronic, progressive disease that begins with inflammation and infiltration, goes on to atrophy and is often complicated by degeneration or hypertrophic changes well exemplified in this series of cases. They were unable to determine any etiologic factor and, as has been the common experience in the past, therapy is of no avail.

New Immunologic Reaction for Diagnosis of Lymphogranuloma Inguinale.—Reiss shows that the serum of patients with lymphogranuloma inguinale has antigenic properties. He submits a new immunologic reaction for the diagnosis of lymphogranuloma inguinale based on the antigenic properties of such serum. The absence of antibodies in the serum is evident, because, when the serum is combined with the Frei antigen, instead of neutralization he has observed an increase in the reaction. Blood was taken in clinically typical cases verified by a positive Frei reaction. The serum was separated, mixed with a 0.5 per cent solution of phenol and kept in the icebox. Before the test was attempted, the serum was proved to be sterile culturally. The author performed the experiment in six cases, with uniform results. Tests were made with the following preparations: (1) for the control a 0.5 per cent solution of phenol in physiologic solution of sodium chloride, (2) the Frei antigen, (3) a mixture of 0.05 cc. of Frei antigen with 0.05 cc. of blood serum from a patient with lymphogranuloma inguinale (injected intradermally) and (4) 0.1 cc. of blood serum from a patient with lymphogranuloma inguinale (injected intradermally).

Maize Oil in Treatment of Eczema.—Cornbleet treated eighty-seven cases of eczema with maize oil, with gratifying results. A few of the patients had asthma and this was benefited in some as well as the eczema. The improvement seems permanent, and there have been few relapses in the four and a half years since the treatment has been used. A number of patients who had had eczema since infancy have remained well for as long as three years. By eczema is meant the condition generally referred to as allergic eczema, exudative and diathetic eczema, Besnier's prurigo or generalized neurodermatitis. In most of the author's patients the condition commenced in infancy and continued indefinitely with alternating exacerbations and relatively quiescent intervals during which the skin at the usual sites was thickened, scaly and pigmented. The patients were more than 5 years of age and for the most part were adolescent boys and girls and young adults. Before the use of the oil was commenced, it was ascertained that the patient would not recover easily or at least not on standard therapy. In a few cases, local adjuvant measures were used to relieve itching. The average time necessary to achieve a clinical cure is from twelve to eighteen months. The maize oil was given orally. The patient began taking one tablespoonful before or after meals, whenever he tolerated it best. The dose was increased gradually until four tablespoonfuls was taken three times a day. The author used an especially refined maize oil which is less disagreeable to the taste and is tolerated better than that bought in the open market. The oil when taken slightly chilled is more palatable.

Archives of Neurology and Psychiatry, Chicago

33: 247-452 (Feb.) 1935

Cranial and Cervical Chordomas: Clinical and Histologic Study. A. W. Adson, J. W. Kernohan and H. W. Woltman, Rochester, Minn.—p. 247.
Nuclei of Posterior Funiculi in Macacus Rhesus: Anatomic and Experimental Investigation. A. Ferraro and S. E. Barrera, New York.—p. 262.
Cerebral Circulation: XXXV. Comparative Effect of Ergotamine Tartrate on Arteries in Pia, Dura and Skin of Cats. J. L. Pool and G. I. Nason, Boston.—p. 276.
Sacrococcygeal Chordomas: Clinical and Pathologic Study. Eleanor M. Fletcher, H. W. Woltman and A. W. Adson, Rochester, Minn.—p. 283.
Gestalt Function in Visual Motor Patterns in Organic Disease of the Brain, Including Dementia Paralytica, Alcoholic Psychoses, Traumatic Psychoses and Acute Confusional States. Lauretta Bender, New York.—p. 300.
*Calcium Content of Cerebrospinal Fluid, Blood Serum and Serum Ultrafiltrate: Its Relation to Clinical Findings in Eighty Neuropsychiatric Patients. J. J. Michaels, Boston, and Olive M. Searle, Ann Arbor, Mich.—p. 330.
Pharmacodynamic Investigation of Autonomic Nervous System in Schizophrenia: I. Effect of Intravenous Injections of Epinephrine on Blood Pressure and Pulse Rate. H. Freeman and H. T. Carmichael, Worcester, Mass.—p. 342.
*Experimentally Produced Convulsions: Effect on Thujone Convulsions of Insulin and of Variations in Water Content of Brain. H. M. Keith, Montreal.—p. 353.
Choked Disk and Papillitis: Differential Diagnosis by Protein Content of Aqueous. E. Selinger, Chicago.—p. 360.
Feeling of Unreality as a Differential Symptom of Mild Depressions. J. C. Yaskin, Philadelphia.—p. 368.

Calcium Content of Cerebrospinal Fluid, Blood Serum and Serum Ultrafiltrate.—Michaels and Searle compared the calcium content of the blood and the cerebrospinal fluid with that of an ultrafiltrate of the serum. Their series, in which these three determinations were made simultaneously, consists of eighty cases in which eighteen various neuropsychiatric diagnoses were made. In conditions of nervous instability, various somatic and neurologic deviations, vasomotor instability and retinal endarteritis, the calcium observations were not different from those in cases that did not present these conditions. The constitutional type (asthenic, athletic or pyknic), weight-height index, sex, age, blood pressure and intelligence quotient could not be correlated. The ratios of diffused to nondiffused calcium and the permeability quotients were within normal limits. It seems strongly indicated that one obtain blood and spinal fluids simultaneously and study the interrelationship of the calcium partitions with the values for other substances in these fluids, especially the amounts of inorganic phosphates and other inorganic elements and of proteins and, above all, the potassium-calcium ratios. The intensive study of fewer cases, with repeated studies of individual cases to ascertain normal fluctuations, especially when the clinical manifestations may be evanescent and transitory, is desirable. Prolonged persistent studies throughout the various phases of an illness as it occurs in the evolution of a psychosis, especially in epilepsy, are also necessary. A multidimensional point of view implying knowledge of the integration and intricate intercorrelations and interdependence of all the levels of the personality is essential for any valuable contribution in the realm of calcium metabolism in patients with neuropsychiatric disorders.

Effect on Thujone Convulsions of Insulin and of Variations in Water Content of Brain.—Keith observed that the administration of large amounts of water by stomach tube, accompanied by repeated subcutaneous injections of pitressin, causes spontaneous convulsions in rabbits, with an increase in the water content of the brain, and makes them much more susceptible to thujone convulsions. Pitressin alone, given in repeated subcutaneous injections, does not increase the water content of the brain but does increase to a slight extent the animal's susceptibility to thujone convulsions. Distilled water given by stomach tube in large amounts increases, to some

extent, the susceptibility of the rabbit to thujone convulsions and, to a considerable extent, the water content of the brain. The production of a maximal increase in the water content of the rabbit's brain by means of intravenous injection of hypotonic solution of sodium chloride does not increase the animal's susceptibility to thujone convulsions. The production of insulin hypoglycemia to the point at which spontaneous convulsions occur makes rabbits more susceptible to thujone convulsions and there is some increase in the water content of the brain accompanying this procedure. Hypoglycemic convulsions and convulsions produced by the administration of water, or water and pitressin, do not inhibit the convulsant action of thujone. Whatever the factor may be that increases the animal's susceptibility to convulsions, it is evidently not the increase in the water content of the brain.

Canadian Medical Association Journal, Montreal

32: 117-232 (Feb.) 1935

Inclusion Blennorrhea. S. H. McKee, Montreal.—p. 119.
Dislocation of Radiocarpal Joint. F. J. Tees, Montreal.—p. 122.
*Polycythemia Vera, with Especial Reference to Nervous Manifestations: Analysis of Nine Cases. L. J. Adams, Montreal.—p. 128.
*Further Observations Following Administration of Tetanus Toxoid. P. A. T. Sneath and E. G. Kerslake, Toronto.—p. 132.
Prediction of Basal Metabolism from Pulse Pressure and Pulse Rate. I. M. Rabinowitch, Montreal.—p. 135.
Prognostic Value of Renal Function Tests in Pulmonary Tuberculosis. A. S. Kennedy, Hamilton, Ont.—p. 142.
Recent Discoveries in Pathology of Nasal and Aural Mucosa. R. A. Fenton, Portland, Ore.—p. 147.
Complications and Disappointments in Radium Therapy for Cancer of Uterus. P. Findley, Omaha.—p. 154.
Clinical Hyperthyroidism Associated with Normal Basal Metabolic Rate. S. Gordon and R. R. Graham, Toronto.—p. 162.
Significance of Postoperative Thyroid Reaction. J. K. Latchford, Toronto.—p. 165.
Retroperitoneal Abscess, with Discussion of Case. C. B. Rich, Provost, Alta.—p. 169.
Torsion of Omentum. O. W. Niemeier, Hamilton, Ont.—p. 175.
Calcium Therapy in Tropical Diseases. Pauline Beregoff, Montreal. —p. 177.
Conjugal Psychopathy and Psychoneuroses. H. C. Moorhouse, Brockville, Ont.—p. 178.
Uniovular Twins: Schizophrenia and Tuberculosis. G. E. Reed, Montreal.—p. 180.

Polycythemia Vera and Nervous Manifestations.—Adams reports nine cases of polycythemia vera, in six of which medical advice was sought for symptoms referable to the nervous system (headache, dizziness and paresthesia). The length of time under observation varied from six months to eleven years. In one case a cerebral decompression was performed for a suspected brain tumor. The differential diagnosis was difficult because of the presence of a preceding injury to the skull. The three cases in which there were abdominal complaints also offered diagnostic difficulties, as evidenced by fruitless surgical procedures. The average age of onset of symptoms in eight cases was fifty years. In one case in addition to ascites an extensive recurring hydrothorax was present. Three patients had an associated hypertension at the time the polycythemia was recognized. It is impossible in each instance to state which condition occurred first. Two patients, observed over a long period of time in the hospital, received treatment which reduced the red blood count, resulting in marked symptomatic improvement, but failed to lower the blood pressure. In all three cases the heart was found to be normal in size. Splenomegaly was present in every case, which with the blood picture formed the criteria for diagnosis. In addition the liver was palpable in all except one. The tendency to bleed was exemplified by its occurrence in all cases except one. Every patient subjected to surgical procedures suffered from postoperative hemorrhage. Therefore every known or suspected case of polycythemia should be admitted to the hospital prior to an operation of any kind, including tooth extractions. Treatment consisted in the use of phenylhydrazine hydrochloride and roentgen irradiation. Roentgen therapy in repeated small doses over the long bones, as recommended by Pack and Craver, has been the method of choice in recent years.

Observations Following Administration of Tetanus Toxoid.—Sneath and Kerslake state that the demonstration of residual amounts of tetanus antitoxin in the blood serums of twenty-five out of twenty-seven adults a year after the injection of three doses of tetanus toxoid is of distinct value as an indication of the persistence of this antitoxin induced by active immunization. There is definite evidence that a secondary stimulus with tetanus toxoid induces not only the rapid development of tetanus antitoxin in man but also an enhancement of antitoxin titer within a week, on an average of about twenty times that of the residual amounts found a year after three doses of toxoid. Since three days after the prophylactic injection of 1,500 American units of tetanus antitoxin the blood serum of man has been shown to contain from 0.1 to 0.25 unit per cubic centimeter, it is evident that within a week of the secondary stimulus thirteen persons of a group of fourteen developed at least the equivalent of that afforded by a prophylactic dose of antitoxin. The serum titer of the same persons continued after a month to show antitoxin at levels sufficient to retain this degree of protection. Although one of the group failed to develop antitoxin to this level, there is no doubt that it was possible in this instance to induce the early development of a measurable amount of antitoxin as a result of a secondary stimulus, whereas it was not possible to show that such followed the first series of toxoid injections.

Johns Hopkins Hospital Bulletin, Baltimore

56: 61-116 (Feb.) 1935

Effect of Alcohol on Cortical and Subcortical Activity Measured by Conditioned Reflex Method. W. H. Gantt, Baltimore.—p. 61.
Researches on Tetanus: II. Toxin of Bacillus Tetani Is Not Transported to Central Nervous System by Any Component of Peripheral Nerve Trunks. J. J. Abel, E. A. Evans Jr., B. Hampil and F. C. Lee, Baltimore.—p. 84.

Journal of Bacteriology, Baltimore

29: 91-222 (Feb.) 1935

Serendipity. M. J. Rosenau, Boston.—p. 91.
Protractor for Computing Growth Rate of Bacteria. O. Rahn and M. M. Mason, Ithaca, N. Y.—p. 99.
Comparison of Maximal Growth Rates of Various Bacteria Under Optimal Conditions. M. M. Mason, Ithaca, N. Y.—p. 103.
Fibrinolytic Activity of Hemolytic Streptococci in Relation to Source of Strains and to Cultural Reactions. W. S. Tillett, Baltimore.—p. 111.
The Morgan Bacillus. E. O. Jordan, R. R. Crawford and Josephine McBroom, Chicago.—p. 131.
Precipitation of Bacterial Polysaccharides with Calcium Phosphate: Pneumococcus. L. D. Felton, Gladys Kauffmann and Helene J. Stahl, Boston.—p. 149.
*Comparative Studies of Presumptive Test Mediums for Coli-Aerogenes Group of Bacteria. I. V. Shunk, Chapel Hill, N. C.—p. 163.
Studies on Anaerobic Bacteria: III. Historical Review and Technic of Culture of Certain Thermophilic Anaerobes. L. S. McClung, Madison, Wis.—p. 173.
Id.: IV. Taxonomy of Cultures of Thermophilic Species Causing Swells of Canned Foods. L. S. McClung, Madison, Wis.—p. 189.
Studies of Certain Factors Influencing Size of Bacterial Populations. J. P. Cleary, P. J. Beard and C. E. Clifton, San Francisco.—p. 205.
Some Properties of Bacterial Inhibitory Substance Produced by a Mold. R. D. Reid, State College, Pa.—p. 215.

Comparison of Presumptive Test Mediums for Coli-Aerogenes Group of Bacteria.—Shunk tested pure culture strains of Escherichia, Aerobacter and Citrobacter from thirty subjects, 201 strains in all, for gas formation in plain lactose broth, brilliant green lactose peptone bile, crystal violet buffered broth and fuchsin broth. When small inoculums were used (less than fifty organisms per tube) lactose broth and brilliant green lactose peptone bile gave positive tests after twenty-four hours of incubation at 37 C. for all the 201 strains. In crystal violet broth after forty-eight hours of incubation with similar small inoculums only 49 per cent of these strains gave positive tests. From only five persons of the thirty did all strains produce as much as 10 per cent of gas in forty-eight hours, and all strains from five others failed to form gas in the same period of incubation. Few strains formed gas in fuchsin broth when small inoculums were used, and with relatively large inoculums only thirty-three of the 201 strains formed gas in forty-eight hours. When small inoculums of a dye sensitive strain of Escherichia were added to the crystal violet broth and the tubes were also inoculated with a loop of a culture of a greenish fluorescent water organism, the fluorescent bacterium so modified the medium that this strain was able to produce gas in forty-eight hours or less. Fewer failures to get gas formation in the presence of Escherichia-Aerobacter organisms in water samples are to be expected than the poor showing of this medium when tested by pure culture strains would indicate.

Journal of Biological Chemistry, Baltimore

108: 323-606 (Feb.) 1935. Partial Index

New Method for Determination of Acid-Base Balance in Food Materials. J. Davidson and J. A. LeClerc, Washington, D. C.—p. 337.
Effect of Anterior Pituitary Growth Hormone on Protein Metabolism. N. K. Schaffer and M. Lee, Boston.—p. 355.
Studies on Ketosis: V. Comparative Glycogenic and Ketolytic Action of Glucose and Some Carbohydrate Intermediates. Inez Shapiro, Los Angeles.—p. 373.
*Studies of Incurable Rickets: II. Rôle of Local Factor and of Viosterol in Pathogenesis of Rickets Due to Beryllium. A. E. Sobel, A. R. Goldfarb and B. Kramer, Brooklyn.—p. 395.
Hydrogen Ion Concentration of Contents of Small Intestine. C. S. Robinson, with assistance of R. Johnson and M. Cogan, Nashville, Tenn.—p. 403.
Factors Influencing Activity of Fungus Lipase. D. Kirsh, New Brunswick, N. J.—p. 421.
Nutritive Value of Fatty Acids of Lard and Some of Their Esters. S. Lepkovsky, R. A. Ouer and H. M. Evans, Berkeley, Calif.—p. 431.
Effect of Insulin on Excretion of Allantoin by Normal Dog. P. S. Larson and I. L. Chaikoff, Berkeley, Calif.—p. 457.
State of Cholesterol and Nature of Cholesterol-Protein Complex in Pathologic Body Fluids. M. Bruger, New York.—p. 463.
Micromethod for Estimation of Fat-Soluble Ester Glycerol Contained in Lymph. S. Freeman and T. E. Friedemann, Chicago.—p. 471.
New Formed Hemoglobin and Protein Catabolism in Anemic Dog. F. S. Daft, Frieda S. Robscheit-Robbins and G. H. Whipple, Rochester, N. Y.—p. 487.
Hydrolysis of Glycogen by Muscles and Liver Extracts. A. Carruthers, Peiping, China.—p. 535.
Method for Quantitative Determination of Ascorbic Acid (Vitamin C): Vitamin C Content of Various Plant and Animal Tissues. H. Tauber and I. S. Kleiner, New York.—p. 563.
Effective Method of Extracting Vitamin B. S. Itter, Elsa R. Orent and E. V. McCollum, Baltimore.—p. 571.
Simplified Method for Preparing Lactoflavine and Study of Its Growth Effect. S. Itter, Elsa R. Orent and E. V. McCollum, Baltimore.—p. 579.
Ergot Alkaloids: IV. Cleavage of Ergotinine with Sodium and Butyl Alcohol. W. A. Jacobs and L. C. Craig, New York.—p. 595.

Viosterol in Pathogenesis of Rickets Due to Beryllium.—Sobel and his associates made comparative observations of in vitro calcifications of bones obtained from rats with beryllium and calcium rickets. They found that there was a marked diminution in the calcifying power of bones of animals suffering from beryllium rickets. The bones of rats receiving viosterol in addition to a beryllium rickets-producing diet showed similar diminution of in vitro calcifying ability. Although the administration of viosterol failed to prevent the development of rickets in rats receiving beryllium, it nevertheless resulted in a rise of the calcium-phosphorus product in the serum.

Journal of Nervous and Mental Disease, New York

81: 125-244 (Feb.) 1935

Nucleus of Darkschewitsch and Nucleus Interstitialis in the Brain of Man. W. R. Ingram and S. W. Ranson, Chicago.—p. 125.
*Specificity of Streptococci Isolated in Studies of Diseases of Nervous System: Experimental Reproduction of Persistent Sneezing and Convulsions. E. C. Rosenow, Rochester, Minn.—p. 138.
Psychopharmacology of Sodium Amytal. M. W. Thorner, Norristown, Pa.—p. 161.
*Cortical Autonomic Epilepsy. J. W. Watts and C. H. Frazier, Philadelphia.—p. 168.
Neurologic Aspects of Uveoparotid Fever. P. M. Levin, Chicago.—p. 176.

Specificity of Streptococci Isolated in Studies of Diseases of Nervous System.—The absence of streptococci in cultures of the brain and blood in sixty-two rabbits that had been given injections of sterile filtrates or dead streptococci makes it clear that the streptococci isolated by Rosenow from rabbits that had been given injections of living streptococci were not secondary contaminants from the air or elsewhere. The characteristic cataphoretic time and velocity and virulence, and specific serologic properties also prove their identity. In the case of persistent sneezing, the striking similarity between the symptoms obtained in animals and those of the patient were not limited to reproduction of the chief symptom, persistent sneezing, but included important concomitant symptoms, such as attacks of great restlessness and stormy respirations, expiratory grunting, mucous rattle in the throat and alternation of periods of abnormal excitation with periods of moderate drowsiness or marked lethargy. In no instance were these results obtained under like conditions with streptococci derived from patients who were used as controls, or with streptococci derived from the patient with persistent sneezing some time after recovery, or with this streptococcus after aerobic cultivation, or in a long series of similar experiments with streptococci derived from patients with other diseases. Only a few animals that received injections of streptococci in a study of a series of cases of respiratory arrhythmia were seen to sneeze. The degree and duration of symptoms following injection, especially of the heat-killed organisms and filtrates of active cultures, were quantitatively roughly proportional to the dose injected. The impulse of sneezing was of central origin and was apparently due to lesions resembling those of encephalitis, chiefly in the medulla surrounding the fourth ventricle. The active principle was soluble in ether and was destroyed by boiling. The principle was retained through as high as thirty-nine rapidly repeated subcultures in dextrose-brain broth, through four successive animal passages, and for thirty days at 35 C. on sealed blood-agar slants. It was lost after several aerobic blood-agar platings. These facts, and the fact that no other cases occurred, suggest that the "sneeze-producing" principle and other specific features of this streptococcus represented acquired properties of streptococci normally present in the throat and that these properties were subsequently lost in the throat of the patient as in the test tube.

Cortical Autonomic Epilepsy.—Watts and Frazier point out that recent studies on autonomic representation in the cortex point to an explanation of the long recognized visceral symptoms and signs associated with focal seizures and occurring as an aura or independently. Nausea and vomiting of increased intracranial pressure are, of course, not of localizing importance. However, in focal epilepsy, especially in the absence of increased intracranial pressure, visceral phenomena may assume some significance. As illustrations of these visceral phenomena the authors discuss two cases in which manifestations such as nausea, epigastric distress and vomiting presumably aborted or were substituted for epileptic convulsions. They postulate that the neuronic discharge sometimes manifested itself through the gastro-intestinal musculature and sometimes through the skeletal musculature. In the first case nausea followed by vomiting aborted individual epileptic convulsions. In the other case several focal convulsions occurred, followed by an interval of four years in which there were periodic attacks of nausea and vomiting but no convulsions. After four years the characteristic convulsive seizures were resumed. Nausea and vomiting may be considered the result of neuronic discharge from the motor autonomic portion of the cerebral cortex. Epigastric auras and other abdominal sensations usually are not so-called referred sensations but probably arise from vigorous and perhaps abnormal movements of the gastro-intestinal tract. Insufficient work has been done to know what part of the human cortex contains autonomic representation.

Medical Bull. of Veterans' Adm., Washington, D. C.

11: 185-284 (Jan.) 1935

Some General Considerations of Pulmonary Surgery. H. P. Reid.—p. 185.
Classification and Treatment of Anemias. P. B. Matz.—p. 194.
Spontaneous Pneumothorax. A. Schomer and D. E. Ehrlich.—p. 206.
*Superdiathermy in Treatment of Dementia Paralytica. J. G. Cullins, H. P. Morgan and W. Seymour.—p. 217.
Diathermy in Treatment of Neurosyphilis. O. L. Nelson.—p. 223.
Mental Deficiency. E. M. Levy.—p. 229.
Habit Training. D. Goode.—p. 237.
Pilonidal Cyst. L. B. Kline.—p. 241.
Encephalitis Lethargica: Report of Six Cases Treated with Hyperimmunized Rabbit Brain. H. L. Flowers.—p. 247.
Observation for Seizures. J. N. Perkins.—p. 253.
Codeine in Treatment of Advanced Pulmonary Tuberculosis. J. P. Wood.—p. 256.
Nineteen Cases of Pneumonia in Members of the Civilian Conservation Corps with No Deaths. F. L. Borglum.—p. 258.

Superdiathermy in Treatment of Dementia Paralytica.—Cullins and his associates employed hyperpyrexia extensively in the treatment of patients suffering from dementia paralytica, whenever it was thought that the patient would cooperate to any degree. Since 1932, seventy-eight paretic patients have been given malarial therapy. No deaths have followed this form of treatment. Their conclusions are that malarial inoculations are the treatment of choice in all cases of dementia paralytica in which barring contraindications it is possible to administer this type of therapy. When a patient is encountered who will be unable to withstand the rigors of an illness such as

malaria, superdiathermy may be instituted. In the last three years 205 patients have been treated with superdiathermy requiring 1,771 treatments. Discontinuance was necessary in only eight cases because of slight burns and in twenty-nine others in which cyanosis, rapid heart action or general restlessness developed. Diathermy was not administered more than twice a year to any patient. A course of ten treatments was arbitrarily instituted and was followed throughout the series. An attempt was made to maintain a total of sixty hours of fever with a temperature ranging from 104 to 106 F. throughout the course. The temperature can be reduced by opening the covers from the feet and legs and from round the neck. If necessary, the patient's feet and legs can be cooled by the application of towels and cool water. After the temperature has decreased to the desired point the feet and legs may be covered again and the temperature allowed to remain at the desired level. A comparatively large number of patients derived considerable benefit from this form of therapy, in that the majority of them showed unmistakable evidences of improvement characterized by changes in weight, behavior, blood and spinal fluid. The period of life expectancy has been prolonged in a number of these patients and they have generally improved otherwise. It is difficult to state the exact therapeutic agent that was instrumental in bringing about the improvement because the majority of the patients had been treated before they arrived at the hospital. A certain number had been treated by malaria; others had been treated by diathermy and others by a combination of antisyphilitic remedies. There are many reasons for the belief that superdiathermy has its place in the treatment of neurosyphilitic patients and that malaria and chemotherapy also have their advantages and disadvantages. There seems to be little doubt as to the efficacy of malaria, and undoubtedly the administration of this form of therapy is of paramount importance, while superdiathermy probably occupies a place second only to malaria.

New England Journal of Medicine, Boston

212: 183-228 (Jan. 31) 1935

Association of Pylephlebitis and Appendicitis. W. H. Snyder, M. G. Hall and A. W. Allen, Boston.—p. 183.

Studies on Ovarian Dysfunction: I. Hormone "Measuring Sticks" Available for Clinical Use and Values Obtained on Normal Individuals. F. Albright, J. A. Halsted and Elizabeth Cloney, Boston. —p. 192.

Bronchiectasis as Source of Scarlet Fever Dissemination. H. Spencer, Wellesley, Mass.—p. 196.

Strangulation (Torsion) of Gallbladder with Perforation and Gangrene in Boy of Seventeen: Report of Case. E. Blank, Fitchburg, Mass. —p. 197.

Insect Bite Followed by Gas Gangrene in a Diabetic: Report of Case. J. R. Barry, West Roxbury, Mass.—p. 198.

Attempt to Secure X-Ray Examination of Uncooperative Tuberculous Contact. H. R. Edwards, New York.—p. 198.

212: 229-282 (Feb. 7) 1935

Tidal Drainage of Urinary Bladder: Preliminary Report of This Method of Treatment as Applied to Cord Bladders with Description of Apparatus. D. Munro and J. Hahn, Boston.—p. 229.

*Diaphragmatic Hernia at Esophageal Hiatus, the Short Esophagus and Thoracic Stomach. P. E. Truesdale, Fall River, Mass.—p. 240.

Studies on Ovarian Dysfunction: II. Application of Hormone Measuring Sticks to Sorting Out and to Treatment of Various Types of Amenorrhea. F. Albright and J. A. Halsted, Boston.—p. 250.

*Comparison of Yeast Milk and Irradiated Milk in Treatment of Infantile Rickets. E. T. Wyman, R. C. Eley, Boston; J. W. M. Bunker and R. S. Harris, Cambridge, Mass.—p. 257.

Diaphragmatic Hernia at Esophageal Hiatus, the Short Esophagus and Thoracic Stomach.—Truesdale presents the fourth case of hiatus hernia of the diaphragm treated surgically by a thoracic approach which has resulted in partial relief of symptoms and cannot be termed a cure. A comparative study of his specimens with illustrations in the works of other investigators prompts him to offer a new theory as to the origin of congenital short esophagus and thoracic stomach: 1. The enlarged esophageal hiatus or any other congenital aperture in the diaphragm occurs as a result of embryologic failure of fusion. 2. Almost invariably, thoracic stomach is the result of herniation through a congenital hiatus hernia and may occur at any time after birth. 3. The short esophagus is the result of cessation of traction on it by the stomach, which has assumed a position in the thorax. In many instances a short esophagus of a few centimeters is the result of inflammatory changes at its lower end. Reasonably accurate deductions as to the position of the stomach and the length of the esophagus can be made only by careful observation at the operating table or at necropsy.

Comparison of Yeast Milk and Irradiated Milk in Treatment of Infantile Rickets. — Wyman and his co-workers selected six infants having active rickets, who on admission to the hospital were placed in a separate ward and during a preliminary period were given a simple calory adequate diet, without antirachitic supplement, to make certain that healing was not taking place, after which the milk in the diet of three infants was replaced by irradiated milk and that of the other three infants was replaced by yeast milk. During the test period, roentgenograms and blood analyses were made frequently. The six infants showed healing within four weeks when fed from 26 to 32 ounces of vitamin D milk daily, irrespective of whether it was irradiated milk of 50 units or yeast-fed cow's milk of from 60 to 65 units per quart. Roentgenologically there is no obvious difference in the clinical antirachitic value of the two types of milk. All the cases showed a calcium phosphorus product of less than 40 when the vitamin milk was first administered. The progressive increase of this product throughout the duration of the test is indicated. The general trend of the curves is substantially the same for all groups. If the rate of increase of the serum calcium phosphorus product is an index of the rate of recovery from rickets, there is nothing to choose between the rates of recovery on the two kinds of milk used.

Northwest Medicine, Seattle

34: 37-74 (Feb.) 1935

Outbreak of Dysentery Caused by the Sonne Type of Bacillus. H. J. Sears, J. B. Bilderback, C. G. Ashley and Martha Rohner, Portland, Ore.—p. 37.

Endoscopic Prostatic Resections. W. J. Pennock, Spokane, Wash. —p. 42.

Epidemic Parotitis Complicated by Acute Appendicitis. W. B. Seelye, Seattle.—p. 44.

*Tannic Acid Silver Nitrate Treatment of Burns: Method of Minimizing Shock and Toxemia and Shortening Convalescence. A. G. Bettman, Portland, Ore.—p. 46.

Arachnidism: Black Widow Spider Poisoning. C. B. Philip, Hamilton, Mont.—p. 52.

Foreign Protein Therapy: Its Present Status in Otorhinolaryngology. E. A. Woods, Ashland, Ore.—p. 55.

Resuscitation of the Asphyxiated. F. L. Wood, Lynden, Wash.—p. 59.

Multiple Sclerosis: Report of Case in Boy of Fifteen. C. A. Veasey Sr., Spokane, Wash.—p. 60.

Tannic Acid Silver Nitrate Treatment of Burns.—Bettman submits an improvement on the tannic acid method of treating burns. The method consists in the use of a 5 per cent solution of tannic acid followed by a 10 per cent solution of silver nitrate. He states that far better results are obtained and lists the following advantages: 1. The saving of lives that would be lost through the slower method of tanning. 2. The immediate stopping of the loss of body fluids, thereby preventing the consequent concentration of the blood. 3. The immediate prevention or very definite minimizing of shock. 4. The immediate prevention of the absorption of toxic products. 5. The prevention of infection by the short period of application of moisture and the early drying of the tanned tissues. 6. The saving of the kidneys and other organs from the effects of fluid concentration and the absorption of toxins and infection. 7. The greater comfort of the patient. 8. Safe carrying of the patient past the first twenty-four hours, which is the most critical period following a serious burn. 9. Avoidance of the second critical period, that of infection and late absorption of toxic products. 10. The simplification of the nursing problem, especially in the first twenty-four hours. 11. The prevention of further breaking down of tissues, which results from long application of wet dressings. 12. The prevention of chilling, which also results from the long application of cold, wet dressings. 13. The formation of a thin, flexible coagulum. 14. The speedy healing of the burned areas with a shortened period of hospitalization. 15. The prevention or minimizing of heavy contracting scars by early, rapid healing in the absence of infection. 16. The lessening of the amount of skin grafting and secondary corrective surgery necessary. The author has treated twenty-one cases with gratifying results except in the case of a man of 77 who had an 80 per cent burn and who died ten hours after the accident.

Psychiatric Quarterly, Albany, N. Y.

9: 1-180 (Jan.) 1935

Research and Teaching Activities of Psychiatric Institute During Past Year. C. O. Cheney, New York.—p. 5.
Acidophilus Milk Therapy. N. Kopeloff, New York.—p. 20.
Clinical Work in State Schools for Mental Defectives. H. W. Potter, New York.—p. 27.
*Blood-Cerebrospinal Fluid Barrier, with Especial Reference to Changes in General Paralysis and in Dementia Praecox. J. H. Masserman, Baltimore.—p. 48.
Prevalence of Mental Diseases Among Urban and Rural Populations of New York State. B. Malzberg, Albany, N. Y.—p. 55.
Effect of Intercurrent Somatic Disease on Manic-Depressive Reactions. L. R. Wolberg, Kings Park, N. Y.—p. 88.
What Happens to Mental Patients After Discharge from Hospital. R. G. Fuller, Albany, N. Y.—p. 95.
Treatment of Psychoneurosis in State Hospitals. H. H. Berman, Ogdensburg, N. Y.—p. 105.
Some Clinical Manifestations of Traumatic Decerebration. A. J. Rosanoff, Los Angeles.—p. 116.
Hereditary and Environmental Factors in Causation of Dementia Praecox and Manic-Depressive Psychoses. H. M. Pollock, B. Malzberg and R. G. Fuller, Albany, N. Y.—p. 129.

Blood-Cerebrospinal Fluid Barrier.—Masserman gave twenty-eight paretic and twenty-two schizophrenic patients 0.01 Gm. of sodium bromide by mouth per pound of body weight three times a day for five days, after which the bromide content of the blood, spinal fluid and cisternal fluid was determined. Analysis (by the method of Walter) of the data showed that the mean bromide contents of both the lumbar and the cisternal fluid of the paretic group exceeded those of the schizophrenic group by 3.64 ± 0.0983 and 3.29 ± 0.604 mg. per hundred cubic centimeters, indicating a significantly lowered blood-cerebrospinal fluid barrier permeability to bromides in dementia paralytica as contrasted with schizophrenia. That the barrier permeability in dementia paralytica is lower than normal whereas in schizophrenia it is abnormally high is indicated by contrasting the blood-cerebrospinal fluid ratios of both psychotic groups with those of a group of normals reported by Malamud. The latter comparisons may not be determinative because of the possibly different technic employed.

Virginia Medical Monthly, Richmond

61: 625-684 (Feb.) 1935

Heart Disease: Fundamentals in Physiology and Pathology of Circulation. R. A. Morison, Abingdon.—p. 626.
Id.: Arrhythmias. D. B. Stuart, Roanoke.—p. 631.
Id.: Congestive Heart Failure. W. P. Jackson, Roanoke.—p. 635.
Coronary Thrombosis. W. I. Owens, Pulaski.—p. 638.
Collapse Therapy in Pulmonary Tuberculosis. J. B. Nicholls and L. R. Broome, Catawba Sanatorium.—p. 639.
Drug Idiosyncrasy and Neutropenia. Regena Cook Beck, Richmond.—p. 643.
Evipal Anesthesia. C. S. White and J. L. Collins, Washington, D. C.—p. 647.
Surgical Treatment of Retinal Detachment with Electrocoagulation. C. A. Young, Roanoke.—p. 650.
*Recurrent Rheumatic Fever with Pericarditis Terminating in Septicemia: Report of Case with Necropsy and Experimental Bacteriologic Studies. W. M. Yater and O. F. Hedley, Washington, D. C.—p. 654.
Appendicitis Versus Its Complications. G. H. Reese, Petersburg.—p. 659.
Observations in Management of One Hundred Consecutive Cataract Operations. E. G. Gill and J. A. Pilcher Jr., Roanoke.—p. 663.
Abdominal Emergencies. M. H. Todd, Norfolk.—p. 665.
Acute Congestive Glaucoma in a Previously Hypotonic Eye: Case Report. R. H. Courtney, Richmond.—p. 667.

Recurrent Rheumatic Fever with Pericarditis Terminating in Septicemia.—Yater and Hedley cite a case in which attacks of rheumatic fever recurred for a year and a half and were alleviated by salicylate therapy and in one of which there was pericarditis with effusion. During one of these attacks of polyarthritis, manifestations of septicemia developed suddenly which did not respond to salicylates. Blood cultures showed flourishing growths of alpha prime streptococci. At necropsy there was evidence of healed pericarditis and a purulent peritoneal effusion of unexplained origin. Experimental bacteriologic studies with monkeys and rabbits showed that the organism isolated from the patient's blood was extremely virulent and produced in many of the animals arthritis and ulcerovegetative endocarditis. The relationship to rheumatic fever of streptococci in the general circulation or infected tissues is still a question. Many of the earlier workers occasionally obtained streptococci on blood culture or on culture of joint fluids. These were hailed as possible etiologic agents. In no instances have these claims been substantiated.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

47: 51-84 (Feb.) 1935

*Psoriasiform Carcinoma of Skin. L. Savatard.—p. 51.
Eczema. J. T. Ingram.—p. 64.

Psoriasiform Carcinoma of Skin.—In 1930 Savatard suggested that intra-epidermal carcinomas of the skin differed only from the more usual carcinomas of epidermal origin in that their intra-epidermal growth was prolonged and that, though they may at some period proliferate within the cutis with tumor formation, they may never do so or they may atrophy in part or in whole; that the ordinary epithelioma also originates intra-epidermally, but proliferation within the cutis with tumor formation so rapidly supervenes that its intra-epidermal spread is obliterated, yet if examined at an early stage lateral intra-epidermal spread, as well as downward proliferation within the cutis, can be appreciated, though the intra-epidermal spread is not characterized by the same morphologic cellular change as is the case in these chronic superficial lesions. He also indicated that unless the fact that these superficial, apparently benign lesions are carcinomas confined for the most part within the epidermis, and not precarcinomas, was recognized, a true conception of the pathogenesis of carcinoma of the skin would not prevail. Having observed several new cases he concludes that: 1. The psoriasiform carcinoma is a chronic superficial carcinoma of the skin. 2. It may be either intra-epidermal or intra-epithelial. In the former the neoplasia affects the epidermis alone, while in the latter the epidermal disturbance is associated with a similar hyperplasia within the sweat ducts and glands. 3. Paget's disease of the nipple is usually an intra-epithelial carcinoma affecting the mammary ducts as well as the skin round the nipple, but it may be a purely intra-epidermal carcinoma without lesions of the duct. 4. "Extramammary" Paget's disease is usually an intra-epidermal carcinoma, though in the rarer cases, when sweat ducts and glands are involved, it must be considered as being intra-epithelial. Such cases correspond to the usual mammary type. 5. Histologic evidence indicates that the psoriasiform carcinoma spreads not by permeation of tumor cells into the surrounding healthy epidermis but by what may be termed a "cancerous metaplasia" of adjacent normal cells.

British Journal of Ophthalmology, London

19: 65-128 (Feb.) 1935

Congenital Coloboma of Macula: Together with Account of Familial Occurrence of Bilateral Macular Coloboma in Association with Apical Dystrophy of Hands and Feet. A. Sorsby.—p. 65.
Improvement in Technic of Vogt's Method of Skeleton Free Radiography of Bulb: Creation of Exophthalmos. Marguerite Kaelin-Sulzer.—p. 91.
Inflammatory Pseudotumor of Orbit: Case. T. Colley.—p. 93.
New Therapeutic Diathermy Electrode. F. W. Law.—p. 96.
Refractive Error of Twins. F. W. Law.—p. 99.
Some Practical Points in Treatment of Simple Detachment of Retina. H. Ridley.—p. 101.
*Intracorneal Injections of Cyanide of Mercury in Trachomatous Pannus. E. S. Shalom.—p. 107.

Intracorneal Injections of Mercuric Cyanide in Trachomatous Pannus.—Shalom treated twenty-five cases of severe pannus rebellious to previous treatment by intracorneal injections of mercuric cyanide. Under local anesthesia of a 1 per cent solution of pantocain an eye speculum is introduced and a 1 cc. record syringe containing 0.5 cc. of 1:1,000 mercuric cyanide is fitted with a very fine needle. The patient is asked to look downward, and with the eye of the needle turned toward the cornea the needle is introduced tangentially into the corneal substance about 1 mm. from the limbus, usually in the upper part of the cornea where the pannus is thickest: a few drops of the solution are injected slowly. The cornea at once assumes a grayish opaque color which spreads from the upper part of the cornea downward, the extent depending on the amount of solution injected. The needle is withdrawn, the speculum is removed and the eye may be left open or bandaged. The whole procedure is painless. The twenty-five patients operated on continued receiving daily local treatment in the outpatient dispensaries. Two months later five showed a recur-

rence of the pannus in a much milder form. They received intracorneal injections again and when examined four months later showed macroscopically clear corneas. In three cases although the pannus infiltration had disappeared, two months after the operation, fine blood vessels could still be seen running in the cornea. Ten cases examined by the slit lamp showed that the pannus had decreased quantitatively and qualitatively, but trachomatous vascularization was still present in all.

British Journal of Radiology, London

8: 65-136 (Feb.) 1935

Tissue Culture: II. Its Application to Radiologic Research. F. G. Spear.—p. 68.
Osteochondritis. J. F. Brailsford.—p. 87.

Lancet, London

1: 129-186 (Jan. 19) 1935

*Treatment of Malignant Disease in Upper Jaw. W. D. Harmer.—p. 129.
Observations on Rickets. W. Sheldon.—p. 134.
Immunization Against Diphtheria by Means of Single Dose of Alum-Precipitated Toxoid (A. P. T.). E. A. Underwood.—p. 137.
*Indications for Clinical Use of Progestin: Standardized Corpus Luteum Extract. P. M. F. Bishop, F. Cook and A. C. Hampson.—p. 139.
Renal Dwarfism Associated with Valvular Obstruction of Posterior Urethra. R. W. B. Ellis.—p. 142.
Experiment in First Class Protein. H. C. C. Mann, with introduction by F. G. Hopkins.—p. 145.
*Transitory Reduplication of Second Tricuspid Sound as Sole Sign of Coronary Thrombosis. J. H. Williams.—p. 147.

Treatment of Malignant Disease in Upper Jaw.—Harmer states that the combination of surgery, diathermy and irradiation marks the great advance that has been made in the treatment of malignant disease of the upper jaw. A large percentage of his cases (110) have been advanced, some of them hopeless, so that treatment was given merely for palliation, and yet nearly a third of the carcinoma patients are living, two for two years, five for three years, one for four years and six for five years or more; half the sarcoma patients are alive, and those who survive for more than one year usually remain free from disease for long periods, and, although only two of the endothelioma patients are now living, four others survived for more than three years.

Clinical Use of Progestin.—Bishop and his associates indicate the underlying principles by which they have been guided in their use of progestin. After a consideration of the interrelations of the pituitary, ovary and uterus they suggest the use of progestin in: 1. Habitual abortion; the injection of 1 rabbit unit daily for two months, commencing a month before the usual time of abortion. 2. Threatened abortion; steps should be taken to determine, as far as possible, whether the fetus is still alive, and then 1 rabbit unit of progestin should be administered daily until signs of threatened abortion have disappeared. 3. Functional menorrhagia; progestin should be given in combination with anterior pituitary extracts. The anterior pituitary factor should be administered continuously by injections of up to 500 rat units three times a week in the course of two months. The course may be repeated after an interval of a month or two. In the premenstrual phase and during the actual time of the bleeding the anterior pituitary extract should be given daily, together with 1 rabbit unit of progestin. 4. Dysmenorrhea; 1 rabbit unit of progestin should be given daily, commencing as soon as the pain appears, or a day or two before if possible and continuing until the period ceases. 5. Uterine hypoplasia, scanty, infrequent menses and amenorrhea; the result of treatment in these cases can best be evaluated by measuring the length of the uterus with a sound. Treatment should consist of 250,000 international units of estrogenic substance (in the form of dihydro-estrin benzoate) injected on the first, fourth, eighth, eleventh and fifteenth days of the course, a total of two and one-half million units being given. On the nineteenth, twentieth, twenty-first, twenty-second and twenty-third days 1 rabbit unit of progestin is administered. Menstrual bleeding commences on any day up to ten days after the last injection of progestin. This course should be repeated once, and about a fortnight later the length of the uterus should be measured again. The authors have been concerned solely with the endocrine causes of these cases of functional disorders of menstruation and pregnancy, but they point out that other predisposing factors should not be neglected in treating these patients. The three most important considerations are the necessity for excluding organic lesions of the pelvic organs, the difficulty of obtaining an accurate and reasonable history and of assessing subjective symptoms, and the difficulty of determining the degree of psychologic disturbance.

Transitory Reduplication of Second Tricuspid Sound.—Williams reports a case of coronary thrombosis of the T_1 type in which a striking reduplication of the tricuspid second sound occurred for four days after the closure. This was the only sign of cardiac abnormality, as the history of the coronary attack was not obtained until after electrocardiographic diagnosis had been made, owing to the patient's apprehension. As a result of this apprehension and the otherwise normal observations on examination of the heart, the patient might reasonably have been dismissed as having no abnormal condition and allowed to return to ordinary work, probably with disastrous results. The view is put forward that a transitory reduplication of the tricuspid second sound is highly suggestive of coronary thrombosis and that any patient showing this sign after a fainting attack should be submitted to expert electrocardiographic examination before being allowed to return to his usual duties.

South African Medical Journal, Cape Town

9: 1-32 (Jan. 12) 1935

Malaria Control in the Transvaal. S. Annecke.—p. 3.
Recent Observations on Sex Physiology in Sheep. J. Quinlan.—p. 7.
Intussusception. P. Hack.—p. 11.
*Xerophthalmia and Its Treatment: New Indication for Central Tarsorrhaphy. H. de Villiers.—p. 13.
Posttraumatic Psychosis. M. J. Cohen.—p. 15.

Xerophthalmia and Its Treatment.—In cases of xerophthalmia in which the cornea was involved and in which the prognosis seemed particularly bad and little or no improvement could be seen in spite of lengthy treatment, de Villiers performed a central tarsorrhaphy in addition to the cod liver oil treatment. It seemed a logical operation to do to (1) reduce the exposure of the eye, (2) increase the temperature of the cornea, (3) increase the humidity of the corneal surface and eliminate the desiccating influence of the air and (4) reduce the exposure of the eye to the bright light: in short, to increase the vitality of the affected cornea. The number of cases in which it was done from a statistical point of view was negligible, but the results were sufficiently good to encourage the author to recommend the operation in cases of xerophthalmia in which the cornea is involved, as an addition to the usual treatment. The adhesion can be divided at any time later and the lids function again in the normal manner.

Journal of Oriental Medicine, South Manchuria

22: 1-20 (Jan.) 1935

Correction Factors of Birth and Death Rates in Various Countries. S. Kawahito and S. Hashizume.—p. 1.
Experimental Studies on Pathogenesis of Giant Cell Produced by Foreign Body. M. Maeta.—p. 5.
Size of Hyoid Bone in the Chinese. K. Miyashita.—p. 6.
Study on History of Bacteria Artificially Introduced into Body and Factors of Infection: Report III. Effect of Cooling Body on Infection of Streptococcus Hemolytic Scarlatinosus and Diplococcus Pneumoniae. N. Nishikawa.—p. 7.
Effect of Local Warming and Cooling of Skin on Cutaneous Insensible Perspiration. K. Takahara.—p. 8.
Influence of Ultraviolet Rays on Sedimentation Speed of Erythrocytes. M. Murayama.—p. 9.
Etiologic Study on Endemic Goiter in Jehol. T. Kodama, S. Suzuki and S. Masayama.—p. 11.
Consumption of Oxygen by Acting Sweat Glands. K. Akimoto.—p. 13.
Studies on Refining Toxin of Absorption Method of Aluminum Hydroxide: Part IV. Toxin of Staphylococcus Albus. M. Yato.—p. 14.
Roentgenograms of Chest of Forty-Four Children with Tuberculous Meningitis. Y. Matsuura.—p. 14.
Experimental Studies on Transmission Mechanism of Typhus Virus by Body Lice. S. Masayama.—p. 15.
Vallate Lingual Papilla in the Chinese. K. Miyashita.—p. 17.
Hydrogen Ion Concentration Within Histiocytes in Their Storing and Phagocytic Functions: Part I. Phagocytosis and Dissimilation of Starch Particles. S. Hatano, S. Iwata, T. Mori, S. Nanba, H. Ryo, M. Arai, S. Baba, T. Goto, S. Yasutake and S. Hamamoto.—p. 19.
Sedimentation Speed of Blood in Alveolar Pyorrhea. T. Hosaka.—p. 20.

Journal d'Urologie Méd. et Chirurgicale, Paris

38: 481-584 (Dec.) 1934

Extravasations of Calix. N. Hortolomei, M. Ornstein-Streja and T. Burghele.—p. 481.
Solitary Cysts of Kidney. L. Lindenfeld.—p. 506.
*New Combined Dye Test for Functional Examination of Kidney. G. Jasienski.—p. 518.
Primary Urinary Bladder Tuberculosis. A. Valerio.—p. 530.

Dye Test for Examination of Renal Function.—Jasienski discusses several dyes in relation to their reflection of the functional condition of the kidneys. Indigo carmine is not retained in the body, is not decomposed and does not lose its coloring qualities. It is eliminated in the urine without change and almost quantitatively. Several conclusions may thus be drawn from the use of this dye in estimations of renal function. The most important of these is when the renal disorder is unilateral, in which case it may be concluded that the elimination of the dye is normal or that it is slower or weaker than that of the opposite kidney, or that it is completely absent. Trypan red is a colloidal dye that does not pass through a membranous filter and is not eliminated by the bile or normal kidney. Introduced into the circulation, it remains for a long time in the organism. Introduced into the circulation immediately before cystoscopy, it is a means of determining whether both kidneys eliminate albumin or whether this elimination is confined to one kidney. The author believes that the qualities of the two dyes when combined clarify an unusually large number of facts concerning renal function. If the kidney eliminates only indigo carmine, it is really healthy. If it is permeable to both dyes, it is diseased. If the elimination is limited to trypan red, the renal parenchyma is seriously damaged. Finally, if no dye is eliminated, some structural abnormality or blockage is the probable explanation.

Presse Médicale, Paris

43: 217-240 (Feb. 9) 1935

Treatment of Acute Pancreatitis. P. Brocq.—p. 217.
*Action of Some Cortical Extracts of Kidney on Urea Retention. D.-M. Gomez.—p. 219.
Mechanism of Diuresis Produced by Organic Mercurial Compounds. B.-G. Bouyoucos.—p. 221.

Action of Cortical Extracts on Urea Retention.—Gomez injected from 3 to 4 cc. of a fresh extract of renal cortex intramuscularly or subcutaneously into thirty-seven patients. The injections were repeated daily for from five to seven days. The patients had an elevated level of blood urea and showed other evidences of renal insufficiency, such as nocturnal pollakiuria and albuminuric retinitis. All had arterial hypertension. They were observed for a considerable period previous to the initiation of therapy and, if they required a low protein diet, they were watched until after stabilization of the humoral state. In twenty-four of thirty-five patients there was a true decrease in blood urea from twenty-four to forty-eight hours after the end of treatment. In eight patients there was no change and in three there was a slight increase of blood urea. In the eight or ten days following there remained a diminished urea level in twenty-six of thirty-three patients. In seven cases the urea remained at the same level as before treatment. A month or six weeks later there was a decrease in fourteen of the fifteen patients followed. In one there was an increase. Between the second and fifth months, only eight cases were studied. In four the urea remained lowered and in four it had returned to the earlier level. Subjectively, improvement was the rule.

Policlinico, Rome

42: 85-132 (Feb. 15) 1935. Surgical Section

Experimental Reproduction of Bronchiectasis. E. Fiorini.—p. 85.
Liponecrosis of Breast with Xanthomatous Degeneration. B. Paggi.—p. 102.
*Primary Perithelioma of Liver: Case. G. Selvaggi.—p. 116.

Primary Perithelioma of Liver.—Selvaggi regards perithelioma as a variety of malignant mesenchymal tumor with histologic, morphologic and clinical characteristics that permit its differentiation from the other forms of mesenchymal tumors. Primary perithelioma or sarcoma of the liver is rare. It can be differentiated from primary cancer of the liver by its objective data: The liver is greatly enlarged and has a nodular nongranular surface; there is neither ascites nor jaundice; the fever is continuous and high; the urine is free of biliary pigments; the evolution of the condition is rapid and acute, and the condition is exceptional in the aged. Primary cancer, on the contrary, gives the following data: The liver is normal, nodular, granulous and cirrhotic; ascites and jaundice are frequent and intense; there is slight or no fever; the urine contains abundant biliary pigments; evolution is slower than in sarcoma, and the condition is exceptional in youth but common in old age. The prognosis of perithelioma of the liver is fatal. Up to the present, both medical and surgical treatment have proved unsatisfactory. Roentgen treatment is harmless and gives good results as a palliative treatment.

Semana Médica, Buenos Aires

42: 237-316 (Jan. 24) 1935. Partial Index

Medical and Surgical Collapse Therapy in Pulmonary Tuberculosis. C. Mainini and M. V. Pozzo.—p. 237.
"Pitres" Inverted Sign in Pleuromediastinopulmonary Neoplasms. R. Novaro and H. J. d'Amato.—p. 244.
Panmyelophthisis Due to Chrysotherapy: Splenectomy: Case. L. de Marval and G. Bomchil.—p. 247.
*Cystic Spinal Arachnitis Causing Medulloradicular Compression. R. Soto Romay.—p. 251.
Ectopic Pregnancy. D. E. Caravias.—p. 260.
Hernia of Spigelian Semilunar Line in the New-Born: Case. A. J. Scopinaro.—p. 284.

Cystic Spinal Arachnitis.—Soto Romay says that cystic spinal arachnitis is frequent. The disease does not constitute an anatomoclinical entity among other clinical processes resulting in medulloradicular compression. The varied symptoms and the conflicting results of the investigations are the characteristics for a diagnosis of presumption, especially if either trauma or tuberculosis, the most frequent etiologic factors of the disease, exists in the history of the patient. In cases in which cystic spinal arachnitis is suspected to be the cause of any medulloradicular compression, early operation is indicated. The meningeal involvement is secondary to the radicular lesion and may be avoided by an early operation. The surgical treatment aims at reestablishing the communication of the subarachnoidal space, which is important for the protection of the neuraxis and should be followed by medical treatment to control the etiologic factor causing the disease.

Beiträge zur Klinik der Tuberkulose, Berlin

86: 1-36 (Jan. 25) 1935

Culture Demonstration of Tubercle Bacilli from Blood of Patients with Pulmonary Tuberculosis by Using Fluid Culture Medium According to Kirchner. T. Uesaka.—p. 1.
Ten Years' Experiences with Collapse Therapy of Pulmonary Tuberculosis. N. Tállyai-Róth.—p. 5.
Complement Fixation in Tuberculosis. L. Nékám Jr.—p. 13.
Cystoid Multiple Tuberculous Osteitis (Jüngling's Disease) and Tuberculoid Tissue Changes in Other Organs. W. Heyden.—p. 23.
*Endogenic Reinfection in Pulmonary Tuberculosis. M. Eltze.—p. 30.
Head's Zones in Pulmonary Tuberculosis. Marie von Babarczy.—p. 33.

Endogenic Reinfection in Pulmonary Tuberculosis.—Eltze describes a case of active pulmonary tuberculosis, which is probably the result of an endogenic reinfection of an old calcified primary focus. The activity of the old primary complex was indicated by the increased sedimentation speed of the erythrocytes before other symptoms became manifest. The author points out that the transmission of a tuberculous inflammation from the primary complex to the pulmonary tissue is a rather frequent occurrence in children but not in adults, although the calcified primary focus has connections with the organism by way of the lymph stream. The interlobar space adjacent to the primary focus became involved, as a tuberculous exudate developed. Interlobar adhesions are frequently observable in roentgenograms. They are not necessarily the result of tuberculosis, but whenever they are found tuberculosis should be thought of. Whether in addition there were primary tuberculous foci in the apical regions, which could not be observed, cannot be definitely decided. The observation that in adults a new tuberculous process may develop outside the apical region, near an old, calcified, primary focus, and in the absence of an infraclavicular infiltrate, is an important observation. It is difficult to decide whether the tuberculous pulmonary process should be considered an endogenic or an exogenic reinfection. Nevertheless, the fact that the process developed near the old primary focus makes an endogenic reinfection from an old primary focus seem most probable.

Deutsche Zeitschrift für Nervenheilkunde, Berlin

135: 81-184 (Jan. 22) 1935

*Pleocytosis in Cerebrospinal Fluid in Course of Cerebral Tumors. J. Rothfeld.—p. 90.
Casuistic Contribution to Pathology of Spatial Determination of Reality. A. Auersperg.—p. 106.
Histopathology of Dorsal Vagus Nucleus (Demonstrated on Alcoholic Poliencephalitis). H. U. Guizetti.—p. 129.
Acute Optic Neuromyelitis. N. A. Popow.—p. 142.
Central Problem of Research on Hysteria. H. Rehder.—p. 158.
*Chronic Trophedema (Nonne-Milroy-Meige's Disease). F. Langsteiner and G. Stiefler.—p. 170.

Pleocytosis in Cerebrospinal Fluid in Cerebral Tumors.—Rothfeld maintains that the condition of the cerebrospinal fluid may vary greatly in patients with cerebral tumors. In some instances the fluid is entirely normal while in others the number of cells, the protein content and the colloid reactions may undergo changes. A number of authors consider a normal cerebrospinal fluid or a slight lymphocytosis characteristic for cerebral tumor. However, in recent years attention has been called to cases with pleocytosis. A case of severe lymphocytosis reported by Scharpff is especially noteworthy, because the histologic examination of the tumor disclosed necrotic foci with distintegrating cells. The author observed a number of cases of cerebral tumor in which the pleocytosis gave difficulties in the differentiation of suppurating meningitis from cerebral abscess. In order to determine whether the pleocytosis in the course of a cerebral tumor is actually due to inflammatory manifestations or to disintegration of the tumor or to its localization, the author decided to compare the cases of pleocytosis with those in which the cerebrospinal fluid was normal. On the basis of the aspects of the cerebrospinal fluid, he was able to differentiate three groups. The first group comprised cases of pleocytosis, with positive protein and positive colloidal gold reactions; some of these patients had cerebral tumors and in others the tumor was in the posterior cranial fossa. The patients belonging to the second group had normal cerebrospinal fluid. In the third group the cerebrospinal fluid presented the compression syndrome. The author reaches the conclusion that pleocytosis in the cerebrospinal fluid of patients with cerebral tumor is not a rare occurrence, for he observed it in 27.6 per cent of the cases. He found that for the development of pleocytosis it is necessary that the tumor be in connection with the ventricular system and that it contain disintegrating and inflammatory processes. In the absence of one of these factors there is no pleocytosis, and the fluid is either normal or presents the syndrome of compression. Proliferation of the tumor into the subarachnoidal space or into the meninges does not necessarily produce pleocytosis. The author concludes from this that, if the cerebrospinal fluid shows a pleocytosis in the course of cerebral tumors, it may be assumed that the tumor has reached the ventricular system and contains processes of distintegration and inflammation, provided the tumor is not localized in the posterior cranial fossa. A normal cerebrospinal fluid or the compression syndrome does not permit conclusions about a relation of the tumor to the ventricular system or about processes in the tumor tissue.

Chronic Trophedema.—Langsteiner and Stiefler describe three cases of noncongenital chronic trophedema. The first case was that of a youth, aged 19. In this case the trophedema involved both legs. According to the statements of the mother of the patient, the swelling appeared first on the right member when the boy was 6 months old, and on the left member six months later. Subsequently the swelling increased. In the course of the second year, and several times later, erysipelas-like symptoms developed on the lower extremities, and, following these attacks, a slight enlargement of the members became evident. In 1926 a phlegmon developed on the right leg and was surgically treated, and during the following year a suppurating fistula developed on the left knee. Healing of the wound after incision was extremely slow. The patient never complained of pain in the lower extremities, and walking was not noticeably impaired. He had a rather feminine type of hair growth and a mild degree of hypogenitalism. The other two cases observed by the authors concerned two sisters. In both, only the left of the lower extremities was involved. There was a quantitative reduction of the electrical irritability in the diseased region. The "wheal time" was shortened in the edematous region. Tests also revealed an increased disintegration of the thyroid and the ovaries and a greatly increased disintegration of the anterior lobe of the hypophysis, factors that are indicative of an involvement of the endocrine glands. The case history of the first of the two sisters is particularly noteworthy because it demonstrates the uselessness of the various surgical interventions and shows that the wearing of suitable bandages is the most satisfactory measure. The authors review several theories on the etiology of trophedema and then mention the different types that were differentiated by Courtellemont. They state that they consider the various eponymic terms (Milroy's, Milroy-Nonne's, or Milroy-Nonne-Meige's disease) less desirable than the term "chronic trophedema." According to the particular type, this term can then be further specified by adding congenital, hereditary or familial.

Klinische Wochenschrift, Berlin

14: 217-256 (Feb. 16) 1935. Partial Index

Protein and Chloride Metabolism After Operations. J. T. R. Schreuder Jr. and W. Bar.—p. 219.
*Diabetic Cataract and Insulin Therapy. R. Braun.—p. 222.
*"Water Intoxication" and Water Diuresis in Adrenal Insufficiency: Significance of Adrenals for Osmoregulation. R. Rigler.—p. 227.
Studies on Nature and Application of Electrophoresis. H. Rutenbeck.—p. 228.
*Course of Blood Ammonia Curve Following Intravenous Glycine Tolerance Test in Liver Diseases. R. Kohn and L. Stein.—p. 233.
*Action of Congo Red in Pernicious Anemia. M. Massa and G. Zolezzi.—p. 235.
Culture of Tubercle Bacilli from Laryngeal Smears. J. Schramek and P. Hegedüs.—p. 237.

Diabetic Cataract and Insulin Therapy.—Braun shows that diabetic cataract is not necessarily the result of a shifting in the osmotic equilibrium between the lens and the aqueous humor of the eye, nor does he think that the acid intoxication of the organism in severe diabetes is the causal factor. He believes that other still unknown factors play a part and that the question of predisposition should be given attention. Large doses of insulin do not damage the lens. On the contrary, it has been demonstrated that under the influence of large doses of insulin advanced opacities of the lens may rapidly disappear.

Significance of Adrenals in Water Exchange.—Rigler states that the osmotic pressure of the cellular contents of mammals is constant and amounts to about 8 atmospheres. Since this pressure is subject to disturbances from numerous factors, precise regulatory mechanisms are required to maintain it. The author cites observations indicating that the adrenals play an important part in this regulation. In a water tolerance test on adrenalectomized adult mice, he observed an extremely limited excretion of water (only one tenth of that of the controls). He assumes the possibility of the existence of accessory adrenals in animals that survive adrenalectomy for longer periods. The exclusion of the adrenal function can evidently be partly compensated by a suitable regulation of the temperature, of the moisture content of the air and of the food. In the feeding of these animals the sodium chloride intake is important. However, even these apparently normal animals show an insufficiency as soon as their osmoregulation is taxed by a water tolerance test. Symptoms develop that correspond to those of "water intoxication," and the animals die in convulsions. The author assumes a possible analogy to eclampsia. For Addison's disease he concludes from these observations that the restricted intake of hypotonic fluids and the treatment with sodium chloride might prove effective.

Blood Ammonia Following Glycine Tolerance Test in Liver Diseases.—After stressing the importance of the liver in the intermediate metabolism, particularly in the deamidization of the amino acids and in the formation of urea, Kohn and Stein report their studies on the ammonia content of the blood following intravenous administration of glycine to persons with and without diseases of the liver. By using a homogeneous amino acid, the physiologic conditions were adhered to closer than by using ammonia salts. The injection was given while the persons were fasting. As a rule, 3 Gm. of glycine was dissolved in 20 cc. of distilled water; the mixture was sterilized and then injected. The first blood specimens were withdrawn five and twenty minutes after the injection.

In persons without disease of the liver, the ammonia content of the blood reached its maximum from sixty to seventy minutes after the injection. In diffuse diseases of the liver the course of the ammonia curve showed the following abnormalities: 1. In the majority of these patients, the maximum was reached much later (from 110 to 120 minutes after the injection). 2. In a second type (rather rare) the increase in the ammonia content was prompt, but the decrease was slow. 3. In a few cases in which other tests of the hepatic function had also been negative, a normal deamidization curve was noted in spite of diffuse hepatic disease. The authors admit that this method permits no differential diagnostic conclusions about the nature of the hepatic disorder.

Congo Red in Pernicious Anemia.—The accidental observation that the blood status of a patient with pernicious anemia improved following the injection of congo red induced Massa and Zolezzi to try this treatment. They employed a 0.5 per cent solution of congo red in a 0.5 per cent solution of sodium chloride prepared in the following manner: Three Gm. of congo red was placed in 600 cc. of distilled water, to which 3 Gm. of sodium chloride had been added. This mixture was heated almost to the boiling point and after twenty-four hours was filtered through paper. The filtrate was poured into ampules of 20 cc. and was sterilized in the autoclave for ten minutes under a pressure of from 0.75 to 1 atmosphere. The authors emphasize that the solution should be clear. The injections (at first from 16 to 20 cc. and later from 9 to 10 cc.) were given intravenously, either daily or every second day, in a series consisting of five or six injections. After an interval of several days, a new series was given. The total number of injections varied between fifteen and thirty-eight. In summarizing the results the authors state that in nine cases of pernicious anemia and in two presenting a symptomatology similar to that of pernicious anemia the injections of congo red produced an almost normal blood status. In three other cases of pernicious anemia the combined use of liver and of congo red had favorable effects, and the authors emphasize that the quantity of liver alone was not sufficient to produce this result. In three other cases the congo red injections produced no noticeable effect, and liver treatment had to be resorted to.

Medizinische Klinik, Berlin

31: 165-196 (Feb. 8) 1935. Partial Index

Pathogenesis, Differential Diagnosis and Treatment of Acute Epididymitis. F. Dietel.—p. 165.
*Is It Justified to Consider Blood Protein as a Specific Organ? E. Kylin.—p. 171.
Paradoxical Shadow in Pneumothorax. F. Fleischner.—p. 179.
Inflammation of Salivary Glands as Relapse of German Measles. Poelchau.—p. 180.
Local Anesthesia in Opening of Paratonsillar Abscesses.—p. 181.

Blood Protein as Special Organ.—Kylin discusses the physiochemical aspects of the blood proteins and emphasizes the difficulties encountered when attempts are made to differentiate between fibrinogen and globulin, on the one hand, and between globulin and albumin, on the other hand. Investigators have pointed out that precipitation and solubility cannot serve as a basis of differentiation, and Bennhold compared the blood protein bodies to the rays of the spectrum, in that the adjoining units gradually blend into one another. Svedberg, however, computed different molecular weights for the different proteins. The author's own studies seemed to corroborate Bennhold's opinion. He discusses the clinical significance of the blood proteins and stresses particularly their adsorptive or vehicle function. He shows that, if the serum proteins are to be considered a specific organ, it should be possible to find disease conditions that are due to an insufficiency of this organ. He calls attention to the significance of the serum proteins in the water and sodium chloride exchange of the organism. Then he cites factors that seem to indicate a relationship between an increase in globulin and infectious diseases, and he believes that the insufficiency of the blood proteins plays an important part in allergic disorders. He concludes that the blood proteins may be considered a special organ but emphasizes that the studies on this organ are only in their beginning stage and that further research is necessary.

Münchener medizinische Wochenschrift, Munich

82: 203-242 (Feb. 7) 1935. Partial Index

Against Pessimism in Treatment of Cancer. A. Hintze.—p. 210.
Bacterial Infection in Light of Biologic Observation. F. O. Höring.—p. 213.
*Traumatic Leukemia and Priapism. O. Rösler.—p. 217.
Testis Hormone in Treatment of Disturbances in Micturition. G. Bodechtel.—p. 219.
Chemotherapy of Erysipelas During Childhood. L. Gmelin.—p. 221.
Simple Treatment of Bronchitis. W. Doreck.—p. 222.

Traumatic Leukemia and Priapism.—Rösler reports the case of a man, aged 38, whose history disclosed malaria contracted during the war and not entirely overcome until 1925 and gas poisoning contracted in 1931 in the course of working with copper ore. While working as a miner, he was injured by a tool that was driven with force against the root of the penis. He felt nauseated for a short period, but a hematoma did not appear. About thirty-three hours after the accident, the penis and the perineum became extremely painful. Then the penis became stiff and swollen, urination was painful, and the temperature increased. Twenty days after the trauma, the patient complained of severe pains in the left epigastrium and the examination revealed a tumor of the spleen which increased rapidly. The blood showed an enormous increase in the number of leukocytes. The erect penis was sensitive to pressure. The spleen was irradiated with roentgen rays. The priapism showed signs of improvement after the first irradiation of the spleen. After three series of five irradiations each, the leukocytes decreased from 357,000 to 34,800 and the swelling of the penis as well as that of the spleen decreased. When after several months the action of the roentgen rays seemed to decrease, arsenic injections were begun and the number of leukocytes became reduced again. The author admits that malaria as well as gas poisoning may cause leukemia but points out that both disorders had existed so long ago that they can hardly be considered etiologic factors, particularly since the patient had been in perfect health for several years previous to the trauma. He thinks that the rapid development of the priapism indicates that in the beginning it was purely traumatic and only later became leukemic, and that there is a connection between the trauma and the leukemia.

Wiener klinische Wochenschrift, Vienna

48: 161-192 (Feb. 8) 1935. Partial Index

*Aspects of Rare Forms of Cutaneous Carcinoma. E. Riecke.—p. 162.
Radium in Treatment of Leukemias. L. Arzt.—p. 166.
Blood Threads. L. Kumer and F. J. Lang.—p. 171.
*Congenital Pachyonychia (Type Riehl). L. Kumer and H. O. Loos.—p. 174.
Prophylaxis of Tetanus in Burns. P. Fasal.—p. 181.
*Increased Ray Sensitivity of Skin During Menstruation. L. Freund.—p. 182.

Rare Forms of Cutaneous Carcinoma.—Riecke describes the history of a woman, aged 62, who stated that a year previously a nodule appeared on her thigh. The nodule became enlarged and suppurated and, in spite of treatment, the condition became more severe. After an erysipelas-like process, new nodules appeared and a severe swelling developed in the flexure of the groin, which finally perforated. New nodules appeared repeatedly and always took the same course. They became soft, disintegrated and exuded a serous fluid. In the differentiation of this process the possibility of a syphilitic gumma had to be considered, the more so since the physician, under whose care the woman was at first, considered it as such. However, the Wassermann reaction was negative and the process did not have the brownish red marginal zone peculiar to syphilitic gummas. Blastomycosis and tuberculosis could likewise be excluded. In view of a similar observation, described many years ago by Riehl, cutaneous carcinoma was thought of. Histologic examination revealed a basocellular carcinoma, the origin of which, because of its advanced stage, could not be detected. In Riehl's case the cyst formation developed in the fatty tissue and in the muscles. There were smaller and larger cysts with a smooth inner surface and a uniform covering of thin, flat cells. Their development did not correspond to the necrobiosis that produces softening in the parenchyma of a cancer but was traced to the combined influence of the carcinoma and the edema of the lower extremi-

ties. In the case here described, the vascular dilatations and the cyst formations in the noncarcinomatous regions indicated the influence of stasis, whereas the lacunar dilatations, within the region of the neoplasm, exemplified a regressive metamorphosis of the carcinomatous parenchyma.

Congenital Pachyonychia (Type Riehl). — Kumer and Loos describe their observations on twenty-three cases of congenital pachyonychia. All these patients show thickened finger and toe nails, symmetrical insular keratomas on the plantar surfaces, follicular keratoses on other parts of the body, oral leukokeratosis (with the formation of whitish spots on the dorsum of the tongue and on the angles of the mouth) and hoarseness. It was possible to trace the heredity of the pachyonychia through five generations. The transmission was dominant. The ratio of healthy persons and diseased ones was fifty-two to twenty-three. Thirteen of the patients were men and ten women. On the basis of their own observations and of those reported in the literature, the authors differentiate three types. To the first types belong the cases in which pachyonychia concurs with symmetrical callosities and keratoses of other parts of the skin; to the second type those in which, in addition to the aforementioned symptoms, there is oral leukokeratosis (type Riehl); to the third type those which show, in addition to pachyonychia, symmetrical tylomas and keratoses of other parts of the skin and also cornification anomalies of the cornea.

Sensitivity of Skin During Menstruation. — Freund observed women who, shortly before and during the menstrual period, showed a greater sensitivity to rays than they did ordinarily. He assumes that abnormal circulatory conditions of the skin, the irritability of the vasomotor apparatus and the greater permeability of the vascular walls, which accompany certain conditions in the female genitalia, play a part in this phenomenon. He admits, however, that various physical and chemical factors may cause the same disturbance at other times. He considers it possible that many of the cutaneous disturbances, known as menstrual dermatoses, are due to the fact that an endogenic or exogenic factor acts on the vessels, the reactivity of which has become increased. As a result of this increased sensitivity, pathologic changes appear in the skin in response to slight noxae that ordinarily would not lead to clinical manifestations. The author concludes from these observations that it is necessary to exercise especial caution when irradiations are given shortly before and during menstruation. On the other hand, he considers it possible that internal organs which otherwise do not readily react to ray therapy may do so during the menstrual period. He admits, however, that an increased reactivity is not necessarily accompanied by an increased therapeutic effect.

Zeitschrift f. d. ges. Neurol. u. Psychiatrie, Berlin

152: 1-144 (Jan. 24) 1935. Partial Index

Extension of Clinical Diagnosis of Cerebrospinal Fluid by Cell Picture of Cerebrospinal Fluid. J. Hempel.—p. 1.
*Choreic Syndrome of Right Upper Extremity as Manifestation of Monosymptomatic Cerebral Syphilis. F. T. Münzer.—p. 12.
Cortical Localization of Sphere of Taste. Alexandra Adler.—p. 25.
Further Studies on C Vitamin in Brain and Cerebrospinal Fluid. F. Plaut and M. Bülow.—p. 84.
*Results of Fourth Series of Measurements on Connection Between Radioactivity and Goiter. T. Lang.—p. 107.

Choreic Syndrome as Manifestation of Cerebral Syphilis.—Münzer gives the history of a man, aged 45, who contracted syphilis thirteen years ago. Immediately after and repeatedly in the next five years, the patient was given antisyphilitic treatment. About thirteen years after contracting the disease (six weeks before consulting the author) the patient developed motor unrest in the right arm, which had all the characteristics of a choreic hyperkinesia. The unrest becomes manifest as primary, isolated or combined movements that occasionally, by synchronous appearance, present the aspect of complicated "motor complexes." Whereas the course of the isolated movements corresponds more to that of Huntington's chorea, the tempo of the motor complexes is more rapid and occasionally resembles a hurling movement. There also exist hypotonia of the same extremity, facial paresis, circumscribed paresthesias in the region of the right thumb and slight increase in the right achilles tendon reflex. Examination of the cerebrospinal fluid revealed the typical aspects of cerebral syphilis. The sudden onset of the hyperkinesia and the fact that it was limited to one extremity makes chorea, due to a focal lesion, seem probable. To be sure, the question of the localization of the focus cannot be answered. In view of the facial paresis and perhaps also of the circumscribed paresthesias of the right thumb, the author thinks that a pathologic process in the left optic thalamus or its surroundings is most likely. This would explain also the increase in the achilles tendon reflex. The patient was subjected to fever therapy and subsequently to treatment with neoarsphenamine. These measures effected considerable improvement. The author concludes that this case contradicts those authors who doubt that choreic motor disturbances may be caused by focal syphilitic processes.

Connection Between Radioactivity and Goiter.—Lang employed the Elster-Deitel wire activation method in order to determine the amount of products of radioactive disintegration in the atmosphere, particularly in the lower layers, in order to be able to estimate the amount of radioactive gases (radon, thoron and actinon). As the amounts of these gases are influenced by the ground, he made tests in regions with certain geologic-petrographic characteristics. He found again, as he had in previous tests, that the atmosphere has the highest values of radioactivity in regions in which goiter is endemic. The values are lower in regions in which goiter is less frequent, and regions that are free from endemic goiter have the lowest values.

Zentralblatt für Gynäkologie, Leipzig

59: 305-368 (Feb. 9) 1935

*Treatment of Gonorrhea with Living Vaccine. W. Schultz.—p. 306.
Operative Therapy of Chronic Inflammatory Disorders of Adnexa. G. Halter.—p. 310.
Casuistics of Disgerminoma. O. Hajek.—p. 317.
Differential Diagnosis of Cystic Tumors of Female Sex Apparatus by Means of Morphologic Examination of Dried Drop of Cystic Fluid. A. W. Hochloff.—p. 321.
*Fecal Concretions Simulating Tumors of Ovary. W. Fischer.—p. 324.
Melanoblastoma of Vulva. Z. Ruffel.—p. 326.

Treatment of Gonorrhea with Living Vaccine. — At Schultz's clinic, treatment with living vaccine has been used since 1930. At first he employed living vaccine, obtained from Berlin and prepared on ascites agar from material obtained from new cases of gonorrhea in men. The organisms had undergone two or, at the most, five passages. Thinking that transportation might impair the efficacy of the vaccines, the author later used suspensions prepared shortly before use from the slant agar cultures. Three or four small injections were given subcutaneously into the thigh in fanlike arrangement. In the evening or on the day following the injection, exhaustion was felt by some patients and occasionally subfebrile temperatures developed. After one or three days, an infiltration formed at the site of injection. As a rule, the inflammation disappeared again in from eight to twelve days. In a few cases an abscess formed, which was opened by puncture. The pus contained only gonococci. Focal reactions and changes in the uterine adnexa were not observed. When three days had elapsed after the injection, the local and resorbent treatment was resumed again and after ten or fourteen days the injection was repeated. In extremely refractory cases a third and fourth injection may become necessary. The first specimens to test the cure were taken three weeks after the first injection. The author agrees with other observers in considering menstruation a biologic provocation. Consequently he arranges it so that the menstruation precedes the taking of the last specimen. After twelve negative preparations have been secured, the patient is discharged as supposedly cured; but control tests are again made after the three subsequent menstruations. If all these tests prove negative, the patient is considered cured. The author obtained more than 70 per cent of cures in 169 cases. The treatment was employed in chronic, not in new, cases. According to other reports, the treatment is of value also in acute cases of gonorrheal arthritis. That the virulence cannot be determined in advance is a disadvantage of the treatment. However, the author emphasizes that in thousands of injections he has never observed a gonorrheal sepsis,

although he admits that other clinics have rejected the treatment with living vaccine.

Fecal Concretions Simulating Tumors of Ovary.—After citing cases from the literature, in which fecal concretions were mistaken for ovarian tumors, Fischer describes a case. Examination revealed to the right of the uterus two stone-hard, free movable bodies, about the size of walnuts, and one such body to the left of the uterus. Examinations on different days always revealed the same formations. The hardness of the bodies seemed to indicate dermoids. Roentgenoscopy disclosed in the small pelvis four spherical bodies. Enemas and cathartics were without effect. The diagnosis of ovarian tumors was given up when, in the course of an examination under anesthesia, it was discovered that the formations had no connection with the ovaries. Finally, four fecal concretions were removed through the rectum. Sectioning of the concretions revealed circular stratification. The author stresses the importance of a thorough examination under anesthesia in case of suspected disorders of the genitalia.

Sovetskaya Klinika, Moscow

19: 283-597 (No. 107-108) 1933. Partial Index

Heart and Surgical Intervention. P. N. Nikolaev.—p. 283.
*Diabetes and Surgical Intervention. I. N. Rybushkin and G. F. Kalmykov.—p. 289.
*Blood Transfusion. N. I. Livshits.—p. 300.
Perspectives of Surgical Intervention in Clinical Forms of Pulmonary Tuberculosis. V. L. Eynis.—p. 309.
*Abscess of Pouch of Douglas After Appendectomy. V. S. Mayat, E. M. Gindin-Finkinshteyn.—p. 520.

Diabetes and Surgical Intervention.—Rybushkin and Kalmykov state that the prognosis of surgical interventions in diabetic patients has been definitely improved by the introduction of insulin and proper diet. Such treatment calls for cooperation of the surgeon with the internist. The preoperative treatment is particularly effective in operations for conditions not caused by diabetes. The operative indications for intercurrent disorders may therefore be made much broader than heretofore. Because of serious complications, primary as well as secondary gangrene still constitutes a grave condition. Conservative treatment of gangrene in diabetic patients calls for the greatest awareness of the danger incurred. When amputation is definitely indicated, further delay is not permissible. Local anesthesia is preferable. The influence of blood transfusion on the postoperative alterations in diabetic patients has not been investigated. It has been suggested that the blood of donors fed on a rich carbohydrate diet before the transfusion will lower the blood sugar in a diabetic recipient.

Blood Transfusion.—Livshits states that the proper time for blood transfusion in patients having cancer is after the operative removal of the tumor. He advises against transfusion in inoperable cancer, since the transfusion stimulates the growth of the tumor and accelerates its breaking down. The effect of blood transfusion in diffuse peritonitis is negligible. The effect in suppurative processes is favorable and is manifested by the improvement of the general condition and more rapid healing of the lesion. The author warns against blood transfusion in tuberculous patients. His experience suggests that activation of the latent tuberculous process is likely to take place. Among prophylactic measures the advisability of one person determining the groups and reexamining the serums is stressed. Group determination of the donor and recipient must be repeated just before the transfusion, as well as the test for biologic compatibility of the two. The transfusion is to be interrupted at once if the patient evinces even the slightest pain or discomfort.

Abscess of Pouch of Douglas After Appendectomy.—Mayat and Gindin-Finkinshteyn report an incidence of abscess in the pouch of Douglas following operation for acute appendicitis in 3.2 per cent of their material (311 cases). They state that the formation of the complication was observed principally in cases in which there were severe pathologic changes in the appendix. Early appendectomy lowers the incidence of this complication. Neither drainage nor primary closure of the abdominal incision without a drain appeared to have a determining effect on the incidence of formation of the abscess in the pouch of Douglas. Among the early symptoms the author noted paresis of the external sphincter of the anus and urinary symptoms, such as retention and tenesmus. Rise of temperature and of leukocytosis after an appendectomy are important from a diagnostic point of view. Digital rectal palpation determines the diagnosis of abscess in the pouch of Douglas. Rectal digital palpation must be practiced in all febrile patients after appendectomy. The best method of treatment of the abscess is by incision of the bulging anterior wall of the rectum. In women it may be accomplished by incision of the posterior vaginal wall. The operation is performed under ether or local anesthesia. The late results of the operative treatment are quite satisfactory.

Hospitalstidende, Copenhagen

78: 113-140 (Jan. 29) 1935

*Renal Disorder in Chronic Alcoholism. F. Vogelius.—p. 121.
Intestinal Canal as Depot of Cevitamic Acid. E. Jacobsen.—p. 131.

Renal Disorder in Chronic Alcoholism.—Vogelius states that Strauss's function test disclosed a disturbance in renal secretion in forty out of fifty cases of confirmed alcoholism. Renal sclerosis was not manifested. Subjective and objective symptoms of nephritis were absent. A slight albumin reaction in the urine, which was often confirmed in these patients and especially in other previously examined alcoholic addicts immediately after hospitalization, practically always disappeared after a day or two in bed but is to be regarded as a sign of slight renal injury due to alcohol intoxication. The renal disturbance took on a grave form in only the minority of the cases and did not on the whole stamp the general picture. A definite tendency to disappearance of the disturbance was seen when the patients lived under favorable conditions. The investigations show, however, that indulgence in alcohol greatly exposes the kidneys to injurious action, contributing to the general breaking down of the organism due to the misuse of alcohol. Examination in thirty-three of the cases revealed gastric achylia in about 50 per cent; polyneuritis, alcoholic amblyopia and dementia were common complications, and dyspepsia and eclampsia somewhat more infrequent, while hematemesis appeared only occasionally; symptoms of cirrhosis of the liver were not established in any case.

Ugeskrift for Læger, Copenhagen

97: 133-162 (Jan. 31) 1935

Certain Irregularities of Roentgenogram in Direct Pyelography, with Especial Regard to Resulting "Remnant Shadows." K. Overgaard.—p. 133.
**Serous Meningitis in Epidemic Parotitis. G. F. Johansen.—p. 137.
*Cowpox Infections in Man. A. Kristjansen.—p. 141.
Milkers' Nodules: Infection from "False Cowpox" by Paravaccinal Virus. P. Bonnevie.—p. 143.
Remarks on New Hemostatic Trombisol Leo (Thrombin Solutum). E. Møller-Christensen.—p. 147.

Serous Meningitis in Epidemic Parotitis.—Johansen reports four certain cases, together with one case of serous meningitis without inflammation of the parotid but with epidemiologic conditions supporting the same etiology. The meningeal symptoms in the four set in at an early stage of the disorder, in three of the cases even preceding the inflammation of the parotid. While the clinical signs of meningitis soon disappeared, constant changes in the spinal fluid persisted after several weeks. Since cases of encephalitis with deeper brain lesions following epidemic parotitis have been reported, rest in bed for several weeks is advocated for patients with parotitis meningitis, in spite of the fact that the subjective symptoms usually disappear in a few days.

Cowpox Infection in Man.—In the first of the two typical cases of milkers' dermatosis described by Kristjansen, in persons who had been milking cows with cowpox, the disease was localized only to the port of entry in the hand; in the second, an extensive secondary metastatic exanthem of erythema multiforme type developed.

CORRECTION

American Journal of Digestive Diseases and Nutrition.—In Current Medical Literature in THE JOURNAL, March 30, the correct title of the second periodical on page 1191 is *American Journal of Digestive Diseases and Nutrition.*